JULY, 1918

International Abstract of Surgery

SUPPLEMENTARY TO

Surgery, Gynecology and Obstetrics

PUBLISHED IN COLLABORATION WITH

Journal de Chirurgie, Paris

Zentralblatt fuer die gesamte Chirurgie und ihre Grenzgebiete, Berlin

Zentralblatt fuer die gesamte Gynaekologie und Geburtshilfe sowie deren Grenzgebiete, Berlin

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Editorial and Business Offices: 30 N. Michigan Ave., Chicago, Illinois, U. S. A.
Publishers for Great Britain: Bailliere, Tindall & Cox, 8 Henrietta St., Covent Garden, London, W. C.

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THE large amount and variety of surgical material afforded by the war has revived and established the truth and usefulness of some almost forgotten knowledge, has confirmed by experience certain present-day theories, has placed in the discard other ideas and practices, and has created entire many new fields of endeavor.

Wounds of the face and jaws — a region in which a good result is so highly desirable — are frequent and frightful, and have been extremely difficult of management. From experience with an enormous amount of material the surgeon has crystallized certain opinions as to the necessities for the successful management of these unfortunate cases.

MAJOR ROBERT H. IVY, M.R.C., has prepared a review of the literature dealing with the evolution of traumatic surgery of the face and jaws, in which present-day opinions and methods are given in detail and their evolution carefully traced through the literature. The management of these cases from the field to their discharge is carefully detailed.

Those interested in the problems of war surgery, and particularly in face and jaw surgery, will read with interest Dr. Ivy's review in the August number of the INTERNATIONAL ABSTRACT OF SURGERY.

INTERNATIONAL ABSTRACT OF SURGERY

JULY, 1918

COLLECTIVE REVIEW

RECENT PROGRESS IN PEDIATRIC SURGERY

By COLEMAN G. BUFORD, M.D., F.A.C.S., Chicago

JUST as pediatric surgery had begun to receive some impetus and recognition as a highly specialized branch of surgery, interest in it was interrupted by the world war which took so many high grade workers to the front; and the attention of surgeons in general became centered upon war surgery. The contributions to the literature naturally began to diminish. Aside from hospitals for children, there have been relatively few hospitals which have set aside a separate department for the surgery of children so that a volume of this work would fall into the hands of a few, who, with their attention so engaged, would develop it and bring forward new questions and interesting points for the betterment of surgery among children.

Few busy general surgeons ever have many infants and small children in their services in any one year. The scarcity of this work and the occupation of surgeons in a much larger sphere has caused the majority of them to fail in grasping much that is valuable and really necessary for the best surgical work among young children. One cannot find the most valuable points ready for him in books; nor if an experienced pediatric surgeon were asked, "What is the difference between your field of work and general surgery, and what are the points the pediatric surgeon has at his command that the general surgeon has not in handling the same class of patients?" he could no more answer than could the artist tell how he mixed his paints to secure that splendid color effect in his sky.

One may develop himself so as to possess all that is implied by living among surgical children and pediatricians. The longer he does so, the more novel will be his experiences and the more multiple and far-reaching will be his observations. The very high fatality which prevails following surgical operations on infants and young children is the strongest evidence that one has something more to think of than to anæsthetize a baby and skilfully perform an operation. The author learned better that to prepare these patients with depleting cathartics or to leave a baby too long without food either before or after operation; this is the frequent starting point of nutritional difficulties which may not be checked. One must never hurry into operations of convenience without being sure that the child's digestion and present state of nourishment is as good as it can be made. In all cases the period of anæsthesia and the amount of anæsthetic should be reduced to a minimum. Preparation of the field before the anæsthetic is begun diminishes considerably the duration of anæsthesia. It is certain that alcoholic vapors suspended in the blood of young animals cause protoplasmal damage often resulting fatally. This is especially true of choloform, the commonly chosen anæsthetic for babies, and a serious error.

The matter of allowing the oozing of blood to continue during operations on babies is a serious thing. Every drop of blood lost counts far more against an infant's prospects for recovery than it does in later life. About eight per cent of the adult body weight is blood, while in the newborn it is about five per cent. In adults, when five of this eight per cent is lost, the patient is pretty certain to die. Should a baby lose the same percentage it is totally exsanguinated. The amount

of blood of babies lost at operation is usually underestimated. The author has previously written (10) that they go to their beds and may deceive one by the quietness of their slumber and their rosy appearance. Continued watching will often show good color of the skin which frequently alternates with extreme pallor about the lips and nose and is evidence of grave danger. When such is seen, the surgeon must give serious consideration to the immediate need of blood and do direct or indirect transfusion. Hypodermoclysis and transfusion with normal salt solution do not often satisfy the demand in young children, and are usually given in excessive amounts causing hydræmia and greatly dimished coagulability.

In the last three years much progress has been made with transfusion by both the direct and indirect methods to resupply the loss of blood through accident, operation, or disease. The greatest drawback to its common acceptance and use as a therapeutic measure is the lack of technical skill, fear of air embolism, and the introduction of clots. The citrate method of indirect transfusion as perfected by Lewisohn (50) and others is so simple that it may safely be used by any one having average surgical skill. Lewisohn states that two-tenths per cent of sodium citrate in blood prevents coagulation outside the body for two or three days. Five grams of sodium citrate can be safely introduced into the adult; more produces toxic symptoms. He rarely transfuses more than 1,000 ccm. of blood, which represents two grams of sodium citrate.

There is no doubt but that transfusion of blood is in its infancy and is going to prove of great value in the treatment of surgical infections, infectious diseases, and as an aid to convalescence in greatly depleted children. The Percy tubes for the transfusion of whole blood are usually too large at their point to introduce into the veins of young children unless the jugular, axillary or femoral be used. They may be blown with especially small points so as to be usable in superficial veins. Bernheim (4) has devised a syringe which, if it has borne out his early expectations, certainly simplifies transfusion. With it the blood is aspirated from the donor into the syringe barrel and with pressure on the piston is immediately injected into the recipient.

Helmholz (36) and others have shown the ease with which indirect transfusions of citrated blood may be made through the longitudinal sinus when the anterior fontanelle is open. This is one of the most inviting routes and because of the ease with which it may be performed should make blood transfusion in babies much more popular, but one must be aware of the danger of passing the needle through the sinus into the brain, thus tearing it; and one must avoid injecting blood into the brain tissue itself.

Woltmann (88) has injected citrated human blood in cases of melæna of the newborn with benefit where injections of horse serum failed. Pool (66) transfused blood into a child of eight months suffering from von Jaksch anæmia, using the Lindemann method. This was followed by splenectomy. There was temporary improvement. In making osteoplastic flaps of the skull when the fontanelles are open, much time may be saved by incision of the fontanelle, passing a director beneath the skull and continuing the osseous incision with heavy scissors instead of ronguers.

Attention has been called (10) to the uselessness of attempting to treat internal hydrocephalus by any one operative procedure on account of the different causes and pathologic states. On the whole there is little new and encouraging concerning the treatment of hydrocephalus. Haynes in 1910 introduced a new method of sinoventricular drainage in a case operated upon for hydrocephalus. He recently reviewed this case (35) and reports the fontanelle tension diminished with general improvement. Peskind (61) reports a similar ventricular drainage with good results.

Intracranial hæmorrhage of the newborn is being diagnosed with increased frequency and has become distinctly a surgical affection. The very mild primary mental, motor, and sensory disturbances may be subjected to temporizing treatment but even these may result in certain brain damage resulting in epilepsy or spastic contractions of muscle groups. If there be doubt as to the diagnosis, a lumbar or subdural puncture may be made. In the milder cases one may consider slight incision of one of the fontanelles or cranial sutures to relieve tension and await developments. In the more severe types an osteoplastic flap should be turned down after proper localization, the clot removed, and the bleeding vessels ligated. It is certainly true that some of the hæmorrhages come from vessel injuries at the base of the skull and cannot be reached for ligation. The operation at least accomplishes relief from pressure and increases the child's prospects of recovery.

In a certain number of patients having either surface, subcortical or basilar hæmorrhages the operation should end with decompression because of the likelihood of failing to find the bleeding points. Useless searching causes increased trau-

ma and loss of blood and increases the risk. There is no doubt of the wisdom of immediate operation in the large majority of cases when the condition of the child permits it. If pressure is not relieved, the surface hæmorrhages permanently damage the cortical cells through pressure and irritation by resulting clots; while in subcortical hæmorrhages, infiltration with blood progresses with resultant damage to the brain cells and breaks up the fibrillary intercommunications.

Sharp and Farrell (75) report sixty-five cases of cerebral spastic paralysis due to hæmorrhage caused by lesions during delivery on whom cranial decompressions were made. There were nine deaths following operation and eight more within two years. Twenty-five of the patients showed a more or less marked improvement and in nineteen there was no improvement. The authors point out the advantages of early operation in selected cases, as the earlier the operations are done, the better are the results.

John Graham has called attention in an unpublished paper to the frequency of fractured skulls in early life coming into the service of the Children's Memcrial Hospital showing few or no focal symptoms, which have been favorably dealt with by temporizing treatment. He emphasizes that when dealing with the elastic skulls of young children and their concussions and fractures a different problem is presented than when dealing with the skulls of adults. Maidagan (53) lately reported on two trepanations for crushing cranial injuries in children of eleven months and nine years respectively. Good results were obtained in both cases.

Surgeons always approach protrusions of the cranial contents in infants with some trepidation. There is always uncertainty as to what will be encountered within and what will be the end-result. Peskind (62) removed an encephalocele from behind the posterior fontanelle in an infant twenty-four days old. It weighed 3 grams. The child recovered. Fracassi (25) did a posterior craniotomy in a boy of thirteen years for a cerebellar tumor. The patient died forty-eight hours later. The tumor was found to be a fibrosarcoma of the pontocerebellar angle. Garzon (28) removed a tumor 47 by 27 cm. from the occipital region in a newly born infant. The child lived, but hydrocephalus developed a few days later.

Kalb (43) operated for epilepsy on a boy of fourteen years He uncovered the left cranial zone and opened the dura. The cerebral cortex was found altered in spots. He dissected small islets out of the diseased areas, leaving the normal cortex. After a week the paralysis had diminished and the patient could walk. After a year and half the physical and psychical improvement still continued.

Maranon and Pintos (54) in a recent case in which they operated upon a boy for a bullet wound of the head found the hypophyseal stalk severed. There was a syndrome of diabetes insipidus and abdominal adiposity. The case they consider establishes that proper kidney action depends upon the secretions of the hypophysis.

Sharpe (76) recommends operation in children even one month old for the treatment of paralyses of the brachial plexus. The earlier the anastomosis of the nerve roots is made, the better are the results and the less formation of fibrous tissue occurs. He gives particulars of such cases operated upon up to the fourteenth year.

In view of the increase in popular recognition of different types of acute bone lesions, there is evidently more need than ever of making roentgen plates of bones of children. Scurvy and bone syphilis are bone lesions which are often revealed where they were not suspected. Osteomyelitis in children is usually demonstrable by X-ray plates, but it frequently occurs that the lesions do not show upon the plates in the first few days. In all cases of osteomyelitis there is an increased tendency among surgeons to search for and remove the primary focus of infection, which is more often found in the teeth and tonsils than is commonly supposed. By removing such foci there may prove to be great diminution in the number of patients showing multiple osteomyelitic foci. Where there has been destruction or surgical removal in the shafts of long bones and failure to regenerate, free inserts of bone are now possible. Such a case was reported by Henders (37) in a patient with osteomyelitis of the left tibia in which he did a subperiosteal resection of the whole shaft. There was incomplete regeneration. A graft taken from the opposite tibia was inserted and later on a second graft was made. The results have been quite satisfactory.

There is great need of surgeons giving more personal care to position and to appliances used in the treatment of fractures of the extremities in young children. It must be borne in mind that many of these cases showing great deformity upon the X-ray plates do not show very bad external deformities which would interfere greatly with future function. Many angulations where union is still imperfect may be forcibly corrected over a wooden wedge or sand bag, while in many where angulation is great and union perfect, correction may be best made by subcutaneous osteotomy rather than by the more dangerous open opera-

tions. It must not be forgotten also that many deformities resulting from angulation will undergo spontaneous correction, part of which is accomplished through the elongation of bones in their growth.

Pediatric surgeons quite generally discourage the excessive amount of open bone work for recent fractures which has been going on during the past few years, but frankly admit the wisdom of open work being done for bad irreducible fractures. Most of these will require no plating, bone inserts, or suturing by wire or other means to retain them in position, but of course should be carefully supported by splints which should go very much further beyond the point of fracture than in more fully developed patients.

Among the more interesting reports of bone work in children are the following: De Pena (19) reported three cases of vertebral osteomyelitis in children of nine, ten and fourteen years respectively. The operations ranged from incision of the periosteum to partial resection of the vertebræ. Rosati (73) removed a pedunculated congenital teratoma from the fourth lumbar vertebra with excellent recovery. Cates (13) reported operated cases of spina bifida. He has operated upon sixteen patients. Ten of these survived more than three months, but two of them died within six months; seven are alive at twenty months to eight years after operation. Petit de la Villeon (64) reports a case of a girl ten months of age operated upon for a lumbosacral tumor weighing 1,650 grams, who made an excellent recovery. Puech (67) made a subtotal resection of the scapula in a little girl eleven years of age for chronic osteoperiosteitis with recovery.

There has been no more novel and creditable work in any branch of surgery in recent years than in that of orthopedic surgery. The splendid open orthopedic work of Ryerson, especially in muscle transplantation for infantile paralysis, is unexcelled, while the work of Albee in Pott's disease has gained world-wide recognition; but these achievements are only fractional parts of progress made in their field. Hibbs (38) reports eight patients with deformity of the spine following poliomyelitis in which he did a fusion operation similar to that done for Pott's disease. All of the patients showed improved posture, more stability and prevention of increased deformity and were spared the necessity of indefinitely wearing a brace. Ryerson (74) in a case of paralysis following anterior poliomyelitis in which the quadriceps extensors of both thighs were paralyzed transplanted the semitendinosus and long head of the biceps from their tibial insertions to the tendon of the quadriceps extensor at the patella with satisfactory results.

Congenital hip dislocation treated operatively is reported by Ridlon, Roederer, Lance, Allison and Dixon, and others. Ridlon (69) finds that it occurs most often in girls. In the treatment he grasps the flexed knee with one hand and with the other seeks the great trochanter and the neck and head of the femur, placing the thumb in front below the spine of the ileum. The femoral head is then pushed down to a position opposite the lower part of the rim of the socket. The thigh is abducted while the opposite side of the pelvis is held down firmly by an assistant. The head can be felt by the operator passing forward into the socket. When the limb is in good position, a plaster cast is applied. Ridlon finds that backward and upward dislocation gives 60 per cent perfect results; directly backward, 60 to 70 per cent; and upward displacements 50 per cent perfect results.

Roederer (71) and Lance (49) recommend the very early reduction of congenital hip luxations. Lance operated upon twenty-one patients under two years of age with good results. Allison and Dixon (2) treated twenty cases, six bilateral and fourteen unilateral. The ages varied from eighteen months to eight years. The operative methods used were the forcible traction on the Bradford device, with sometimes the Lorenz forced abduction. Results in all cases were good. The open method used on some older patients did not give such good results as the closed.

In tubercular cervical adenitis there is a very noticeable increase in the number of surgeons who look upon the tonsils as the usual seat of primary infection, and many insist that a very large percentage of glands not badly damaged show a subsidence of the active process and remain permanently well from a clinical point of view after the removal of the tonsils. Other mouth lesions should be cared for. They believe that tonsillectomy should be routinely done as a part of any surgery directed toward the cure of tubercular cervical adenitis.

Dowd (21) reports on the treatment of tuberculosis of the cervical lymph-nodes by operation. His study is based on 678 cases observed within twenty-two years. Of these, 432 were in the state when the process was strictly local. Ninety-one per cent of these patients treated were apparently cured when last seen and Dowd thinks the results eminently successful. Sixty-eight and two tenths per cent of patients with glandular abscess or glandular enlargement were apparently cured, and 35 per cent of these where there was evidence

of tuberculosis in other parts of the body. In the operation all enlarged glands are entirely removed. In the discussion Ladd (47) reported 93 per cent apparent recoveries in 160 operated cases followed from six months to five years.

The almost uniform death of children under one year of age suffering from empyema still confronts surgeons. The subject needs badly the combined concentrated attention of reliable laboratory and clinical investigators. The fatality diminishes with each year after the first. Bremmerman and Krost have treated seven patients having empyema by aspiration alone, repeating it as soon as the heart became dislodged laterally more than half an inch, which usually occurred in three or four days. They found that in about three weeks the patients with pneumococcic empyema seemed to have a crisis and the thorax did not perceptibly refill. Two of the patients finally required drainage and one of these died. The others are still living. Three have been followed and there are no demonstrable chest changes. Five of these children were between one and two years, while two were under one year of age. Their work is as yet unpublished.

Buford in a few unreported cases repeatedly aspirated pus from the pleural cavities, replacing it with air in some and sterile alboline in others. For a time with each aspiration there was a diminished amount of pus, and the outlook seemed hopeful, but each child finally died of toxæmia or required drainage. Greer (31) treated an interlobar empyema in a boy of five years by artificial pneumothorax with good recovery.

There is still a wide difference of opinion as to whether intercostal incision or rib resection should be done in young children for empyema. Charles Parker collected about forty cases operated upon at the Children's Memorial Hospital showing the death rate to be about equal in the two procedures. In such an analysis the age of each group and their relative prospects for recovery on account of the known age risk should be taken into consideration. The time element in the operation must also be considered. It has been shown that rib resections for empyema may be done in three minutes. In two cases of pyopneumothorax in children of three and one-half years and one and one-half years respectively which Bertoldi (5) operated upon, resection of the seventh rib was followed by death. Pleurotomy gave a similar result.

Weil and Loiseleur (85) having observed the beneficial effects of injections of air in pleural effusions applied this method in a case of tubercular pericarditis with extensive effusion in a boy of fourteen years. The pericardium was repeatedly punctured and serosanguinous fluid withdrawn. The punctures were later followed by injections of air which were repeated. After several treatments radioscopy showed the pericardial cavity quite clear. The authors claim very excellent results from this method. The creation of artificial hydropericardium and pneumopericardium is not followed by untoward results.

Among the abdominal surgical affections of infancy, that of congenital pyloric stenosis for the present exceeds all others in surgical interest. There is no doubt but there is a rapid increase in the number of patients in whom this affection is recognized, and an increase in the recovery rate. The latter is due in part to the improving skill of surgeons in doing gastro-enterostomy for infants on the one hand, and the wider use of the Rammstedt operation on the other. In performing the Rammstedt, the greatest care must be taken not to puncture the mucosa, an accident which has occurred repeatedly in the hands of some of the best workers when doing their first Rammstedt.

There have been several ingenious operations advocated, directed toward the restoration of the severed pyloric ring, eminently that of Strauss. Among the most robust children the author has seen are those on whom only a division of the pyloric ring was done and the muscle stripped back from the underlying mucosa which then pouts between the cut surface of the ring, allowing the stomach to freely empty itself at once. These patients must be weighed daily and the greatest care exercised in after-feeding. When possible their feeding should be directed by a pediatrician. The author feels that this point cannot be sufficiently emphasized.

Many who lately supported gastro-enterostomy for congenital pyloric stenosis are now abandoning it and doing the Rammstedt operation, which certainly requires much less time to perform, and is therefore of great advantage. The temporizing treatment still has some advocates. In view of the present knowledge it ought not to be attempted except under the supervision of the most experienced pediatricians. It is more uncertain as to its outcome and at best often leaves a very badly nourished child with a poor future prospect of becoming a sturdy adult.

Grulee and Lewis (32) review the whole subject and report in detail on fifteen congenital cases operated upon during the past six years by gastro-enterostomy. Their mortality was twenty per cent. They think that a diagnosis of congenital pyloric stenosis is an indication for operation.

The former high mortality has been much reduced of late. As recently as 1906 the mortality was above fifty per cent. They prefer the posterior no-loop gastro-enterostomy to the Rammstedt pyloroplasty inasmuch as it is shorter in execution and there are fewer postoperative complications.

Gallie and Robertson (27) had a mortality of 31.2 per cent in sixteen cases operated upon by the Webber-Rammstedt method. Downes (22) reviews sixty-six cases of infantile pyloric stenosis operated upon. Thirty-five were Rammstedt operations with a mortality of 23 per cent. Thirty-one had a gastro-enterostomy with a mortality of 35 per cent. The author, in view of the results, prefers the Rammstedt operation as simple and one which leaves the gastric tract intact. Strauss (80) gives the details of a new method of pyloroplasty, as he thinks posterior gastro-enterostomy is too severe an operation in the majority of these cases. The incision is small and is supra-umbilical. The pylorus is drawn into the wound and the hypertrophied musculature separated from the mucosa. Strauss claims that his method has many advantages over others. Posterior gastro-enterostomy gave good results to Howell (41) in five cases out of six operated upon.

Extensive gut resections for intussusception have been reported by Fraser (26) and Brockway (8). Ladd (48) gives the statistics of intussusception at the Boston Children's Hospital since 1908. Before 1908 only eight cases of intussusception were operated upon; since 1908 sixty-three cases, with thirty-two recoveries. The mortality is just under 49 per cent. The statistics clearly show that the success is much greater according as the cases are diagnosed and operated upon early. Thus, four cases diagnosed and operated upon within twelve hours all recovered; seventeen cases operated upon after sixty hours gave a mortality of 88 per cent. Apfel (3), Torrance (81), Jopson (42) and Peskind (63) also report successful operations for intussusception in very young infants. In Jopson's case more than 15 cm. of the intestine were removed. Peskind performed an ileocæcostomy.

Wood, Stephens, Rivarola, Willitts and Judell, and Kirmisson report on appendicitis in young children. Wood (87) operated in thirty-one cases of children followed by the Fowler position and Murphy drip method. All gave good results. Stephens (78) in an infant of three weeks found an appendicitis development in the sac of an inguinal hernia. Rivarola (70) from his experience in acute appendicitis thinks that after the acute crisis, when the case has become apyretic, it suffices to do lavage with ether and close the abdomen without drainage. He mentions six cases of children treated in this way with good results. Willitts and Judell (86) operated in forty-four cases in children under fourteen years of age. They found that delayed operations lead to abscess in the great majority of cases; that more rapid recovery occurs when the appendix is removed in abscess cases, and that the peritoneum of the child is more resistant to infection than that of the adult. Of their forty-four cases, twenty-four had abscess formation; they express the opinion that early abscess formation is probably due to the higher location of the appendix in the child. Kirmisson (44) apropos of two cases of gangrenous appendicitis operated upon in children draws attention to the great value of cutaneous hyperæsthesia in the right iliac fossa as diagnostic of this condition.

Cadwallader (12) and Hamann (33) report operations for Hirschsprung's disease. Cadwallader's case was in a boy of nine years. The upper sigmoid, descending colon and part of the transverse colon were resected and an end-to-end anastomosis made. The boy recovered. Hamann had two cases in boys of fifteen and two and one-half years respectively. In the first an artificial anus was created after resection with recovery. In the second case ten inches of large intestine were resected. This patient died from peritonitis.

Wakely (84) did a gastrotomy in a baby of six months for a foreign body swallowed. The child was in excellent condition three weeks later.

Holmes (40) says that congenital obliteration of the bile-ducts is not very rare. Sixteen per cent of the cases reported show that the anatomical relations are such that surgery can afford relief. An artificial passage to the duodenum can be made.

Ernst (24) in a child one year old did a duodeno-entero-anterior anastomosis for congenital atresia of the duodenum. The operation lasted one and one-fourth hours and was well borne, the child having taken 35 gm. of ether. The patient recovered.

Bookman (6) in an urgent laparotomy done on a child of six years for traumatism found extensive laceration of the right coronary ligament of the liver with considerable blood in the abdomen. The laceration was repaired and the wound closed without drainage. The child recovered.

Kirmisson (45) draws attention to the accidents due to a Meckel's diverticulum. In treating a child with such, Kirmisson usually operates in two stages, removing the diverticulum and bury-

ing the stump. Several cases in young children treated thus have given good results.

Graham (30) gives a good review of the results of splenectomy for Banti's disease and reports a case. Other cases have been reported in recent literature.

Tweed (82) sutured a perforated gastric ulcer in a girl of fifteen years. Peritonitis had set in. The girl recovered. This author states that few cases occur under the twentieth year.

Vargas (83) reports a malformation described by Ballantyne under the name of gastroterata or gastroschisis in which the abdominal wall was lacking and the viscera contained in the cavity herniated. The umbilical and peri-umbilical regions were covered, not by skin as normally, but by a whitish gelatinous substance identical with that forming the umbilical cord. There was no other malformation. The infant was brought to Vargas' clinic twelve hours after birth. He proceeded to operate immediately after making sure of hæmostasis in the umbilical cord. His first intention was to draw the skin edges together over the defect by sutures without disturbing the gelatinous covering, but after tying several sutures a rupture occurred and the intestines herniated. The author had much difficulty in reducing them and was obliged to cut his previous stitches.

In the herniated intestine the appendix was seen 3 cm. long, and in accordance with his usual rule, he extirpated the presenting appendix and invaginated the stump. Having performed the appendectomy, the author restored the organs to the cavity, cut away the gelatinous abdominal cover and then proceeded to suture. The peritoneum was first sutured, then the muscular and cutaneous coats drawn together, leaving a cicatrix 7 cm. long. The operation was performed under chloroform and ether narcosis. After ten days the child was in normal condition.

Vargas gives a historical sketch of congenital malformations of this type. Ballantyne only mentions sixteen, but the author has himself seen five, of which he gives short particulars. These include the present case. In one other case in which he operated there was surgical success although the child succumbed later to bronchopneumonia. The only treatment is immediate operation. Kocher has published a list of twenty-four operated cases with recovery. Vargas remarks that this is the only reported case in which an infant so young had a successful appendectomy. Hallet has published a list of fifty-eight cases in which infants were operated upon within thirty-six hours of birth with fifteen deaths.

Ochsner (58) thinks that only seven per cent of herniæ in children require operation and approximately 95 per cent of all cases of hernia will heal if abnormal intra-abdominal pressure is relieved and the hernial sac is kept empty. The latter can be affected by trusses. Operation is indicated: first, in strangulated hernia; second, in irreducible hernia due to adhesions; third, in cases where the opening is unusually large in a free hernia; fourth, in reducible hydrocele; fifth, in cases with undescended testicle unless they show a tendency toward spontaneous cure.

Brossy (9) makes an extensive review of inguinal hernia in young children based on three hundred and thirty-three cases operated upon from 1888 to 1905 in the Children's Hospital at Lausanne. As a result of experience and based upon the operative end-results, Brossy strongly recommends the complete radical operation for inguinal hernia. The results are better in children than in adults, and are better the earlier the operation is done. Of the three hundred and thirty-three operated, the radical operation gave two hundred and forty-seven recoveries remaining permanently cured nine years after operation. There were only seventeen recurrences. Petit de la Villeon (65) removed a hernial sac 7 cm. long from a child two months old with congenital inguinal hernia. He followed the technique of Lorthoir of Brussels, i.e., removing the sac without opening the inguinal canal.

Eisendrath (23) recommends that cases of true non-descent or ectopic descent of the testes should be operated upon at as early an age as possible, the early limit being about two years, as atrophy of the spermatogenic cells occurs in about 90 per cent of the cases.

The following are among the most interesting tumors reported in infants and young children: Adams (1) while operating upon a child of two and one-half years found a tumor of the uterus adherent to the bladder in the retrovesical space. Only part could be removed owing to adhesions. The tumor was a glandular carcinoma. The child died. Simmons (77) did a radical operation on a boy of thirteen years for adenocarcinoma of the breast, the result of traumatism. Harris (34) in a girl of eight years with premature sexual development found on laparotomy an ovarian carcinomatous tumor weighing 1,928 grams. He removed the tumor. The child recovered.

Martin-du-Pan (55) in a case diagnosed as encysted peritonitis in a child aged eight found a pedunculated mesenterial tumor which proved to be a tuberculoma. The child recovered. De Concilliis (18) in a child of nine years found a multilocular lymphatic cyst of the mesentery. There

were two sacs. The transverse colon prevented complete extirpation. The child died. Chiarvallotti (14) removed a fibromyxosarcoma of the mesentery in a two-year old-boy. The child died within twenty-four hours. Craglietto (15) in operating upon a child of three months for an abdominal tumor found a congenital teratoid which was connected with the sacrum. It was enucleated and recovery followed. Higgins (39) removed an ovarian sarcoma from a girl of five years. Both ovaries were involved and removed. The sarcoma weighed 1,578 gr. The child recovered. Goodman (29) removed a large lymphosarcoma found in the sigmoid. The child, however, died four days later.

Dauriac (17) reports a total gastrectomy for a hairy tumor of the stomach, making a direct anastomosis between the œsophagus and duodenum. This was in a girl of thirteen years; she made an excellent recovery and remains in a very good condition. Broca (7) reports a somewhat similar case in a child of three years in which gastrotomy was done with good results.

De Villa (20) operated upon a boy of four years for malignant tumor of the kidney. The tumor ruptured during operation and detritus escaped into the peritoneum. Seven months later the mesenteric glands were observed to be swollen. The boy died. The tumor was a sarcoma. In the author's clinic six similar cases have been operated upon with recovery. Kirmisson and Tretiakoff (46) removed a large adenosarcoma with nephrectomy of the right kidney in a girl aged six years, with subsequent recovery. The tumor weighed 920 gr. Lorca (51) on doing a laparotomy in a girl of ten years found a cystic tumor of the kidney with hydronephrosis. Marsupialization was followed by recovery.

O'Neal (59) reports some rare cases of bladder neoplasms in children which he operated upon. Bladder tumors do not occur often in the very young and the only hope of recovery is through early diagnosis and operation. Both Loumeau (52) and Perrier (60) successfully performed nephrectomy in young children for uronephrosis.

Morse's paper (57) is timely and most important. Much confidence must always be given to whatever he has to say concerning the diseases of childhood. He reviews twenty-three cases of nephritis in children in which Edebohl's operation was done. As a result of the operation, two of the cases have apparently been permanently cured, one being well after nine and the other after eight years. One patient died from acute nephritis two years after operation, but this nephritis was not connected with the previous one. Two patients have been well for as long as observed, but the time is not sufficient to pronounce a definite cure. Nine are much improved after operation. Morse thinks that the operation is valuable in properly selected cases of nephritis in children. It may prolong life for a considerable period. No child with acute nephritis should be allowed to die without the chance offered by operation. Burns (11) found double kidney decapsulation to give satisfactory results in nephritis in a girl of six years.

Cumston (16) reports the occurrence of urethral calculi in a boy of eight years in which he performed ureterotomy and ureterorrhaphy with uncomplicated recovery. He thinks that the extraperitoneal operation is the only logical one, and also that Gibson's technique for exposing th e ureter low down is very advantageous in the case of children. Multiple urinary calculi with successful operation is also reported by Pybus (68). In this case, a boy of ten years, a large stone in the upper end of the ureter as well as one in the right kidney were removed.

Mayo (56) states that thirty-seven patients with exstrophy of the bladder were observed since 1896. Many were too young to be operated upon. Six were treated by plastic methods with one late death. Three were treated by the Maydl-Moynihan method with two operative deaths. Thirteen cases were successfully treated by the transplantation method with only one operative death. Most of the patients were apparently children.

Stevens (79) did a successful implantation of the ureters into the rectum in a child with exstrophy of the bladder. The child is in good condition five years later.

Rollier (72) continues to report on the extremely favorable results obtained by treatment of surgical tuberculosis in children by exposure to the sun at high altitudes. More than twelve years' experience convinces him that this is the treatment for osseous, articular, ganglionary and peritoneal manifestations of tuberculosis. It not only cures but confirms the cure. It is particularly efficacious in the case of children. Orthopedic appliances are used as a supplement to the sun cure.

Buford (10) discusses the field of pediatric surgery which he states offers a variety of work and a fertile field for research and human benefaction. He points out the high fatality among infants subjected to surgical operations, and some of the reasons for it. Reference is made to the need of preparation of relatively larger fields of operation in children and of better after-care.

Attention is called to the need of small laparotomy sheets and sponges. He discusses at some length circumcision, umbilical and inguinal hernia, congenital pyloric stenosis, and bone affections. Goiter in childhood is briefly discussed. A toxic syndrome, referred to in his paper on "Goiter in Children," and the uniformity of hypertrophied tonsils in goiter patients are points still supported by him. He is not operating upon many children for goiter *per se*, but has the focal infections removed and puts them on iron or thyroid feeding or both and symptomatic treatment. Attention is called to the rarity of enlarged cervical lymphnodes accompanying tonsillar hypertrophies in goiter subjects.

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THIRD INTERALLIED SURGICAL CONGRESS FOR THE STUDY OF WAR WOUNDS[1]

(Comptes-rendus de la Conférence Chirurgicale Interalliée pour l'étude des Plaies de Guerre)

THE Third Interallied Surgical Congress, held at Val-de-Grâce, France, November 5 to 8, 1917, was the first of these Congresses in which American surgeons have participated. The following officers were present: Colonel Winter, Lieutenant Colonel Siler, Lieutenant Colonel Keller, Majors Harte, Blake, Finney, Peck, Brewer, Hutchinson, and Lieutenant Davison. All the interallied powers were represented.

The first work of the Congress was the discussion of proposed modifications of some of the conclusions arrived at in the previous congresses. These discussions covered the following questions:

1. The general principles of the treatment of war wounds (Tuffier and Duval).
2. The technical surgical organization of the French Army Service (Duquet).
3. The use of bacteriology in war surgery (Veillon).
4. Serotherapy in the treatment of gaseous gangrene (Sacquépée, Sir Almroth Wright and Fleming).
5. Traumatic shock (Bowlby, Tuffier, Tanton, Govaerts, DePage, and Duval).
6. Amputations (Duval).
7. Prosthetics of the mutilated (Jacob).
8. Surgical treatment of fractures (Duval, Tuffier, and Bowlby).
9. Treatment of articular wounds (Gosset).
10. Brain injuries (Tanton, Guillain, Tuffier, and Jacob).
11. Infection of war wounds (Wright).
12. Penetrating wounds of the chest (Duval, Tuffier, DePage, and Bowlby).

The second part of the Congress was occupied with the consideration of new questions submitted:

1. The treatment of chronic osteomyelitis.
2. The treatment of articular fractures.
3. The end-results of the treatment of thigh fractures.
4. The treatment of the secondary and late complications of war wounds of the brain.
5. Operations on the peripheral nerves and their end-results.
6. Thoraco-abdominal wounds.

Reconsideration of Former Conclusions

In regard to the general principles of the treatment of wounds, Tuffier pointed out that the principal recent innovation in war surgery was toward mechanical disinfection and primary suture. When this was done within twenty-four hours there was 80 per cent success. After forty-eight hours there was 64.5 per cent success. Secondary suture in general has given about 90 per cent success. But with primary suture hospitalization has been reduced to from twenty to thirty days.

Duval dealt with delayed primary suture. Wounds which, owing to the lack of hospitalization, etc., could not be sutured at the front formations were evacuated to a rear hospital and immediately sutured on arrival, unless infected. It has been found that 80 per cent of such evacuations after a primary operation at the front are suturable.

Sacquépée reported that the results of trials of sera prepared against the presumed agents of gaseous gangrene were good, both as regards prophylactic and curative effects. Particulars will be given in the conclusions.

Wright and Fleming hold that the condition which favors the development of the gaseous gangrene microbe is reduced alkalinity of the blood; that acidosis is the principal factor, and that the microbes themselves aid in the elaborations of the acids which reduce the alkalinity. They give tables to show the excellent results obtained from the intravenous injections of sodium salts, lactate of sodium or 5 per cent bicarbonate. They claim that cases inoperable

[1]Arch. de méd. et pharm. mil., Par., 1918, lxix, No. 1, 2.

owing to acidæmia become operable after alkaline injections.

In discussing a paper by SIR ANTHONY BOWLBY on traumatic shock, TUFFIER said that there were three pathological conditions confounded under the name of shock, namely, hæmorrhages which provoke a state of shock, severe intoxications or infections which simulate shock, and true shock absolutely independent of the other two conditions. In hæmorrhages blood transfusions give very favorable results; but in true shock, transfusions give either no or only transitory results. The therapeutic indications must depend on an exact diagnosis of the pathological condition.

GOVAERT's paper dealt with the indications for transfusion, which he pointed out rested on the fact that within the first six hours after wounding the red corpuscles in the blood fell below 4,000,000. Transfusion then finds an absolute indication and the life of the patient can be saved with but little danger to the donor.

TUFFIER reiterated that no case of true shock has been saved by transfusion nor by any other known therapeutic method.

DUVAL reported that since the previous congress real progress had been made in the French army in the surgical treatment of fractures. At that time the question of primary suture of diaphyseal fractures was scarcely discussed; but there has been a change since. At present, as many diaphyseal fractures as possible are sutured directly and immediately. Only shell fractures are dealt with here. During the battle of Flanders 51 per cent of the diaphyseal fractures of the thigh, leg, and arm have been primarily sutured and have given 83 per cent of perfect results. Ninty per cent of forearm fractures primarily sutured have given 100 per cent success. Of humerus fractures 80 per cent, of leg fractures 60 per cent, and of thigh fractures 20 to 25 per cent have been primarily sutured.

DUVAL reported on the recent progress in the surgical treatment of penetrating chest wounds. The tendency is now toward active treatment, i. e., excision of the injured tissue of the lung or pleura, extraction of foreign bodies, suture of the lung, toilet of the pleura, and total closure. During the recent battles of Flanders and of the Aisne, Duval treated 161 chest wounds, the total in his sector. Thirteen died without any intervention; 29 were treated for threatening hæmorrhage, of which 13 died immediately; 33 were systematically operated upon with no deaths; 101 cases were medically treated, with 1 death. In the total of 161, therefore, including the immediate dead, the whole mortality was only 16 per cent, and if the 13 cases without possibility of treatment be excluded, then the mortality is reduced to 8.7 per cent, which certainly shows incontestable progress as regards chest wounds.

WRIGHT, from his investigations regarding the emigration and bactericidal effects of leucocytes, said that the position of the bacteriologist toward the surgeon ought to be changed. In the present conditions the bacteriologist makes a "necro-pyoculture," to know how many live microbes can be found in the pus, and on this finding the surgeon is guided in making secondary suture of an infected wound. It seems to Wright that the bacteriologist should instead make a "bio-pyoculture" and inform the surgeon if the leucocytes of the surface of the wound are capable of destroying the infection which subsists in the wound.

MODIFICATIONS OF CONCLUSIONS

1. *Disinfection of wounds.* Since the last Congress the disinfection of wounds has more and more passed from the domain of chemical disinfection to that of surgical mechanical disinfection. Primary suture has succeeded secondary suture of wounds as a general method.

This primary suture has become the method of choice. It has been practised either at once or as a retarded primary suture (early secondary). It seems that immediate primary suture can be done beyond the limits of time which had been fixed in the case of slight wounds. Delayed primary suture is done in two stages: The first stage consists in mechanical sterilization by excision of the wound, followed by an aseptic or antiseptic dressing; the second stage done from one to four days later is the complete closure of the surgical wound after bacteriologic examination. Among the germs whose presence causes acute severe complications after suture, the streptococcus and the anaerobes, especially the spore-bearing anaerobes, must be given the first place.

2. *Use of bacteriology in war surgery.* The laboratories in connection with the surgical units have been of immense service to surgical technique. They should be perfected from the viewpoint of personnel and material.

Under actual conditions it would be premature to give any concise bacteriologic formula as an indication for the closure of wounds. It is suggested that periodical meetings of the bacteriologists of the different surgical units be held and methods and results discussed for common benefit.

3. *Treatment of gaseous gangrene.* Owing to acidosis, in certain cases of gaseous gangrene an alkaline treatment has been instituted either to permit an ulterior operation in inoperable patients or for disintoxication. This treatment has given encouraging results and it is recommended that new trials be instituted. A certain number of the wounded have been treated by different specific sera: anti-perfringens serum, anti-vibrion-septic serum; anti-bellonensis serum. These three sera have proved harmless. The anti-perfringens serum, used as a preventive in a number of cases, seems to have given favorable results. From a curative point of view the study must be continued. The anti-vibrion-septic and anti-bellonensis sera have given very appreciable results both from preventive and curative standpoints, even in toxic cases far advanced. From these results it would seem advantageous to continue their application.

4. *Shock.* Since the last session the treatment of shock has been modified. In shock three processes must be distinguished: (1) hæmorrhage; (2) infection or supra-acute intoxication; (3) true shock.

It is difficult to distinguish these three states. Count of the red corpuscles in the venous blood done in the hours immediately following injury, taking into account the time elapsed since the traumatism, permits the existence of an important hæmorrhage to be recognized. The results furnished by this method are not applicable to limb wounds, but a marked fall in the red corpuscles indicates a severe hæmorrhage. In such circumstances blood transfusion has been successful. In true shock, warming the patient is the essential element of treatment. It is desirable that all beds allotted for shocked patients should be heated. British surgeons in treating shock employ intravenous injections of solution of bicarbonate of soda, 4 per cent, in doses of 500 ccm. Other saline solutions have not given definite results.

The operative indications in shock, as established in the last Congress, should be adhered to.

5. *Prosthetics of the mutilated.* Experience during recent months has confirmed the superiority of apparatus of rigid material (of which that named "American" is the type) over apparatus of reinforced leather when the stump has terminated its evolution. Temporary apparatus, used when the conditions of the amputation wound permit, considerably hastens the maturity of the stump.

6. *Surgical treatment of war fractures.* The surgical treatment of war fractures has made very great progress: first, in organization, which includes distribution of the wounded from the first aid post in apparatus such as the Thomas splint to secure immobilization; direct evacuation from the first post to operating centers; multiplication of specialized operating centers; perfect accord between the different services, which permits absolute unification of the treatment in its different stages; secondly, in operative technique. Primary reunion of diaphyseal fractures has been the current practice. The present average is about 51 per cent of diaphyseal fractures, due to shells, primarily united. The following principle seems to be evolved: to transform an open war fracture into a closed fracture, either by immediate primary suture or by delayed primary suture under bacteriologic control. Secondary suture after chemical disinfection, bacteriologically controlled, still preserves all its indications.

7. *Articular wounds.* At the present time, complete closure is the universally admitted procedure for articular wounds. Its results are such that when the excision of the contused tissues creates extensive cutaneous losses, the breach can be filled by autotransplants. Bone cavities can be filled in certain cases by pediculated muscle flaps.

8. *Chest wounds.* The surgical treatment of chest wounds clearly tends toward active surgery. Threatening hæmorrhage and open thorax are regularly operated upon. Intrapulmonary projectiles are primarily extracted with direct treatment of the lung wound, according to the general principles of the treatment of war wounds: treatment of the parietal wound, excision, removal of all pulmonary foreign bodies, bone or metallic, cleansing of the wound, and immediate closure of the thorax. The success obtained clearly authorizes this surgery.

Infected hæmothorax is treated by very early drainage, progressive disinfection, and secondary closure of the thorax.

Chronic purulent pleurisies are amenable to progressive sterilization with pleuropulmonary liberation by multiple incisions if necessary.

9. *Craniocerebral wounds.* Wounds of the brain are mechanically disinfected by trepanation, followed by cerebral lavage with warm saline, and extraction of easily accessible projectiles. Bacteriologic control, here as in all infected wounds, indicates the possibility of complete closure. In cases where the foreign body cannot be extracted, primary closure, either immediate or deferred, should only be done with extreme prudence. The greatest circumspection should be observed in the application of plastics.

Consideration of New Questions

TREATMENT OF CHRONIC OSTEOMYELITIS

Papers were submitted by Jacob, Makins, and Conrad, dealing with the methods and spread of infection in the bone and the operative treatment. After discussion the Congress adopted the following conclusions:

1. Osseous infection is produced by the same mechanism as infection in other war wounds. It spreads in two ways: (a) from place to place through the medullary and compact tissue; (b) to a distance along fissures. Penetration through the bone tissue is generally slow and limited.

2. Among the germs which first penetrate may be cited: the streptococcus, the staphylococcus, the enterococcus, more rarely the anaerobic organisms. In subacute or chronic bone suppurations is most frequently found the streptococci, staphylococci, enterococci, and pneumococci.

3. The treatment of chronic osteomyelitis is especially preventive. It consists of nothing else than the treatment of the fracture area. (See the conclusions of the previous Congress on the treatment of fractures).

4. The treatment of established osteomyelitis is at the present time purely surgical. It ought to be early. It consists essentially in: (a) wide opening up of the area; (b) minute search for and removal of all sequestra and foreign bodies; (c) eradicating and leveling all cavities.

5. After these operations there are two courses open: (a) either immediate closure of the wound, the latter being filled by autoplastic strips; (b) or by chemical sterilization of the wound, secondary autoplastics to fill the osseous cavity, and then suture. The latter method is more general.

Jacob reported that Chutro by adopting the complete extensive operation in 50 established cases had obtained 50 recoveries and that in his own series of 42 cases 38 had left the hospital cured and the other 4 were advancing toward cicatrization.

TREATMENT OF JOINT FRACTURES

Wallace thought it was of prime importance in articular wounds to isolate the synovial cavity as completely as possible early in the treatment and to suture immediately wounds of the surrounding soft parts. Experience has shown that the synovial membrane possesses the power of neutralizing infection to a much higher degree than the surrounding soft parts.

There are certain modifications to be observed according to the extent of fracture or injury of the bones of the joint.

Tanton thinks that in all articular wounds except those due to bullets, surgical intervention is indispensable. In primary treatment of articular fractures the indications are: Comminuted fractures are opened up, cleansed, and primarily sutured. Partial epiphyseal or epiphyseometaphyseal fractures are treated by arthrotomy with economic opening up of the joint and followed, if possible, by primary suture. Total and complete epiphyseal fractures, when the lesion is limited to the articular epiphysis properly so-called, are treated by economic and semi-articular resection. Resection is also called for in very comminuted epiphyseometaphyseal and diaphyseometaphyseal fractures; also when only one articular extremity is injured. Crushing injuries with vascular and nerve sections call for amputation.

When a primary operation has not been done for any reason and the condition is one of superacute arthritis with gaseous infection, gangrene and septicæmia, an immediate high amputation is indicated. An early secondary amputation is called for when arthrotomy or some other procedure has failed to arrest infection and this has progressed to a threatening degree. When drainage is indicated, an early secondary resection will accomplish it better than arthrotomy. This operation is especially indicated in severe infected osteo-arthritis.

Willems referred to his original treatment of articular fractures by immediate active mobilization after preliminary surgical cleansing. The active movements are commenced within a few hours after intervention. He reported sixteen patients treated in this manner for various types of articular wounds. He claims that immediate mobilization perfectly realizes articular drainage and obviates arthritis and ankylosis.

After discussion the Congress arrived at these conclusions:

1. The aseptic progress of osteo-articular wounds operated upon within ten to twelve hours after injury suggests that the surgical treatment of articular fractures should tend toward maximum conservation.

2. Epiphyseal or epiphyseometaphyseal comminuted fractures call for opening up, curretting, and primary closing of the articulation.

3. Partial or T-epiphyseal or epiphyseometaphyseal fractures call for arthrotomy with replacement or an economic esquillectomy (atypical partial resection) followed by primary suture.

4. Active immediate mobilization appears to be the indispensable complement of the operative treatment and seems to have given results superior to immobilization.

5. Primary resection is only exceptionally indicated: (a) In osseous lesions it will be limited to very comminuted fractures of the articular extremities, but its indications are wider in the case of the hip and shoulder than in the knee, elbow or instep; (b) the practice of primary resection with a view to obtaining a better functional result ought to give way to conservative methods, either an arthrotomy with esquillectomy, or a typical partial resection. The defective functional results can be remedied by a later orthopedic resection, which is generally superior to that of primary resection.

6. Primary amputation is indicated in crushing injuries with destruction of the main artery.

7. Resection is indicated in infected articular fractures.

FRACTURES OF THE THIGH

DePAGE stated that prior to the installation of the Carrel method in his ambulance service, 65 cases had been treated. These were cases surviving more than forty-eight hours and without shock or anæmia. There were 37 deaths; 17 amputations (12 for gangrene, 3 for hæmorrhage, 2 for infection); in 33 cases the limb was preserved, but as a general rule the functioning was mediocre. Forty-three cases treated since the introduction of the Carrel method have given 2 amputations for gangrene; 1 disarticulation for infection; and 40 recoveries. Fifteen of these have rejoined the colors; of the others only 4 are definitely unfit. The method followed is surgical clearance, resection of all contused tissue, and secondary suture as early as possible under bacteriologic control.

MAX PAGE dealt with the end-results of treatment by immobilization and extension in the British hospitals. In general, shortening of the limb is about one and one-half inches. In the majority of fractures of the upper part of the femur the superior fragment remains in a position of flexion and abduction. In about 75 per cent of fractures of the lower part of the femur there is flexion and displacement of the lower fragment. In general, the muscle functioning is bad, particularly that of the extensor quadriceps. This is probably due to long immobilization.

TUFFIER dealt with the end-results of fractures of the femoral diaphysis only. From official sources he finds that since the beginning of the war up to the end of 1916 there were 16,392 men invalided on account of thigh fractures. This was the most disastrous period of treatment and the results were particularly unfavorable.

Infection of the wound and the osseous area involved ranks as the chief cause of the defective end-results causing secondary osteomyelitis, preventing consolidation and correct alignment, and producing vicious consolidation, vicious cicatrization, and all the functional complications resulting from them. Shortening which is due to the extent of the traumatism is the least serious of the bad end-results.

These results can be and are now being notably improved. Primary or secondary closure of these fractures suppresses all complications due either directly or indirectly to osteomyelitis; it shortens the duration of the treatment and will reduce the complications of invalidism in more than 75 per cent of these cases; it will also enable the surgeon to devote his attention to orthopedic measures.

The reports gave rise to a very animated discussion, after which the Congress adopted these conclusions:

1. In a general way the end-results of the treatment of thigh fractures have been mediocre. This has been due to the extent of the lesions, to insufficiency of the methods of reduction and retention, and especially to infection of the area.

2. The end-results of fractures of the upper third and especially of the lower third of the femur leave the most to be desired.

3. The end-complications most frequently resulting are: (a) infections under the form of chronic osteomyelitis; (b) deformities due to incomplete reduction; (c) less frequently defects of consolidation or functional impotence of articular, muscular, or nervous origin.

4. Shortening is the most frequent deformity and the only one which is not always avoidable.

5. Rotation and angulation are most frequently due to insufficient surgical attention.

6. Primary sterilization is the principal end to realize. Its insufficiency is the essential cause, direct or indirect, of the defective results. The slowness of the treatment of prolonged infections makes retention of the fragments difficult.

7. Primary suture of the wound and secondary suture after cicatrization by transforming an open into a closed fracture have a special influence on the end-results of the treatment of thigh fractures.

8. The very frequent articular stiffness in the knee, hip, and foot, either isolated or associated, can be prevented by early mobilization.

9. Muscular adhesions to the callus are the origin of numerous functional disturbances which may call for surgical liberation.

10. Trophic disturbances, i.e., muscular atrophy, œdema, and vasomotor disturbances, play a very important rôle and should be the object of early and persistent attention.

11. Very marked deviations, with or without osteomyelitis, call for osteotomy. In the case of a concomitant osteomyelitis, resection of the callus is generally indicated.

TREATMENT OF THE SECONDARY AND LATE COMPLICATIONS OF BRAIN WOUNDS

HOLMES' statistics were based on the examination of 2,357 cranial gunshot wound cases treated in the hospitals of Great Britain. In 1,567 of these cases the secondary complications could be studied at a period varying from three months to two or three years after injury. There were 37 cases of secondary abscess after recovery, 28 of which terminated fatally, 9 of them immediately after operation.

In 90 cases of gross cerebral hernia, there were 70 complete recoveries and 20 deaths. It is the general rule of British surgeons not to intervene surgically in such cases, as the results have been unfavorable.

A large number of these cases had large losses of cranial substance, but practically none complained of symptoms which could be attributable to the breach. In only 8 cases was a plastic operation done. A temporary metallic protector is preferred.

Of 164 cases with bullets or shrapnel fragments in the brain examined within two to three years, 12 have died. Abscess is the most important complication in this kind of case. Nine of these had one or more epileptic convulsions.

TUFFIER and GUILLAIN find that in 4,262 old trepanation cases hospitalized in various neurological centers there were 770 hemiplegias, 206 monoplegias and 200 aphasias, occurring in 18.06, 4.83, and 4.69 per cent respectively.

In a total of 6,664 such cases the authors find the following late complications of brain wounds:

	Cases	Percentage
Partial or generalized epileptic seizures	676	10.14
Late cerebral abscess	91	1.41
Late meningitis	32	0.48
Late cerebral hernia	54	0.81
Mortality	83	1.24
Sudden deaths	1	

TUFFIER and GUILLAIN are rather of the opinion that a foreign substance in the brain if well tolerated should be left. The gravity of the prognosis of such cases appears to be exaggerated. Regarding cranioplasty they think in small trepanations it is easy, but of relatively little use; in larger losses of bone substance, on the contrary, it would be very useful, but is then difficult if not impossible, and not without chances of great danger. The operative indications of cranial plastics appear to the authors relatively limited and chiefly for æsthetic reasons.

The general study of secondary and late complications of cranial and cerebral wounds has shown that such complications are less frequent than was supposed, and that the prognosis is brighter than has been stated. This improvement in prognosis undoubtedly depends on early treatment, the technique of which is now more rational and better directed than in the beginning of the war.

The following conclusions were adopted:

1. If secondary complications of cerebral wounds are relatively frequent, later infectious complications are much rarer than supposed.

2. The consecutive organic troubles in brain wounds, i.e., hemiplegia, monoplegia, aphasia, visceral troubles, etc., frequently have a tendency to disappear. Their treatment comes under the domain of neurology.

3. The later epileptic seizures of jacksonian character can be benefited by the removal of the compressive cause, foreign bodies, bone fragments, etc. It is not of much use to operate for one or two isolated attacks of jacksonian epilepsy, for they may be due to encephalitis, capable of resolution, and on which operation would have no influence. Epileptic seizures, outside of cases where a foreign body or a bone fragment exists, do not call for any new surgical operation. Lumbar punctures, in case of hypertension of the cerebrospinal fluid, controlled by a manometer may have a good result.

4. Late cerebral abscesses diagnosed and differentiated from non-suppurative encephalitis ought to be operated upon after accurate clinical localization made by the surgeon and the neurologist. After exploratory puncture and without destroying the protective adhesions, the abscess should be opened and its sterilization followed bacteriologically.

5. Late localized meningitis and encysted abscesses of the meninges must be operated upon.

6. Treatment of generalized meningitis is most frequently ineffective. Repeated lumbar

punctures appear to be the most rational form of treatment.

7. Cerebral herniæ with an abscess are to be operated upon and the abscess drained. It seems preferable to abstain from lumbar puncture at the first acute feverish stage of certain cerebral herniæ in view of avoiding possible diffusion of a localized infection. When the initial infection has subsided, lumbar puncture by diminishing the intracranial pressure may favor the reduction of these herniæ. The resection of herniæ is an operation only justified in a case of local necrosis or of meningocele.

8. Intracerebral foreign bodies causing attacks of encephalitis or epileptic seizures should be extracted. Foreign bodies that cause no trouble should be left alone.

9. Cranioplasty is indicated from the æsthetic point of view, especially in losses of substance of the frontal region. From the therapeutic point of view it is only justified in cases where the extension of the scar is the cause of complications observed. From the prophylactic viewpoint the danger of an ulterior cranial accident in the trepanned region may be an operative indication. In any case there should be assurance that there are no contra-indications to intervention on the score of nervous trouble, chemical or cytologic modification in the cerebrospinal fluid, or papillary stasis.

10. Early treatment and methodical disinfection, with primary sterilization of the intracerebral traumatized area is the best prophylactic treatment of secondary or late infective complications of head wounds.

OPERATIONS ON THE PERIPHERAL NERVES AND THEIR END-RESULTS

DEPAGE reported the researches and cases observed in the Belgian ambulance "Ocean" at LaPanne. These comprised 46 cases of complete transverse section and 22 cases of partial lesion, compression, adhesion, lateral neuroma, etc. Complete interruptions of the nerve were treated by resection and suture. De Page says that in 95 per cent of such cases there is certainty of the growth and of the penetration of the young fibers into the peripheric end; and to effect this is the object of surgery. Expectant treatment must be discouraged; immediate or early surgery is the treatment of choice. Suture of the nerve gives good results in 80 per cent of cases. These results depend on early operation; a sufficiently large resection of the nerve extremities; exact, hermetic, superficial suture; wrapping the nerve-ends in a suitable sheath, preferably cellulo-adipose. Grafting is recommended when a very considerable gap exists between the two ends. Autotransplants appear to be best. In partial lesions operation is successful in the majority of cases. This is either a decompression, destruction of adhesion, or resection of a tumor.

GOSSET presents a résumé of French neurological surgery since the beginning of the war, and its end-results. His statistics comprise 1,340 operations on nerves reported as carried out in various neurological centers, the cases of individual surgeons as reported in the literature, and 671 operations on peripheral nerves carried out in his own personal service.

The results, which are discussed in detail for each nerve, are summed up in the following tables:

Table 1. Comparison of the results of 1,340 nerve operations according to figures furnished by various neurological centers and without specifying the nature of the operation:

	Percentage Improved
Brachial plexus	50
Median	23
Radial	25
Ulnar	38
Sciatic	40
External popliteal	45
Internal popliteal	42

These figures obtained from very different sources have only a relative value. For instance, in the case of the radial nerve only 25 per cent of success is shown, whereas the statistics of individual surgeons give 50 to 80 per cent of good results for this nerve.

Table 2. Six hundred and seventy-one personal cases of nerve lesions operated in Gosset's service:

	No Results Per cent	Improvement Per cent	Considerable Improvement Per cent	Recoveries Per cent
Liberation of Nerve				
External popliteal	33.3	....	44.4	22.2
Radial	18.2	22.8	40.8	18.2
Sciatic	21.1	31.5	31.5	15.8
Brachial plexus	14.3	21.4	50	14.3
Internal popliteal	....	50	50	....
Median	10	43.3	40	6.6
Ulnar	28.1	28.1	31.2	12.5
After Suture:				
Brachial plexus	....	....	66.6	33.3
Radial	37	3.7	33.3	26
Sciatic	38.8	11.1	50	....
External popliteal	22.2	27.7	50	....
Internal popliteal	25	25	25	25
Ulnar	47.2	36.1	8.3	8.3
Median	43.7	12.5	43.7	....

The average time for return of voluntary movements after nerve resection and end-to-end suture and after nerve liberations shown in the following table:

	After resection and suture	After liberation
Median.....	6 months, 23 days	5 months, 5 days
Radial.....	8 months	3 months, 27 days
External popliteal ...	10 months, 25 days	4 months, 21 days
Internal popliteal ...	11 months	
Ulnar	11 months, 11 days	5 months, 15 days
Brachial plexus	12 months, 15 days	4 months, 15 days
Sciatic	16 months	8 months

GOSSET concludes from his study that at the present time suture is the true method of treating nerve lesions. If it has not always given the expected results, it is because the operation was done late after suppuration and when the nerve-ends were much separated and converted into fibrous tissue.

The Congress adopted the following conclusions:

1. Operations on the nerves for wounds of war have given only relatively mediocre results up to the present time. Partial lesions give a percentage of good results superior to that of total lesions.

2. These mediocre results are especially due to the late period of operation.

3. Operation should never be done when there is suppuration in the region.

4. The three principal causes of failure in late operations on nerves are: (a) sclerosis of the peripheric end which increases as time goes on; (b) too great separation of the two ends; (c) intensity and duration of the suppuration.

5. Tendinous retractions, articular ankylosis, muscular ischæmia, and sclerosis in a great measure diminish the value of functional results. It is necessary from the beginning to give to the articulations an appropriate correct position.

6. Primary suture of the nerve, made possible by the present methods of disinfection of wounds, considerably improved the results from the point of view of the frequency, rapidity, and degree of functional recovery.

7. Even in the case of an unsuccessful result, primary suture maintains the nerve extremities in such an anatomical condition that a new operation is greatly facilitated.

8. Functional recoveries are slowly effected; they demand months, perhaps years; and this must be taken into consideration in the appropriation of pensions.

THORACO-ABDOMINAL WOUNDS

BOWLBY finds that there is a thoraco-abdominal lesion in about 9 per cent of all thoracic wounds. He reports on 55 such. One or more of the abdominal viscera may be involved. He thinks the diaphragm opening is better approached from the pleura; and that if an abdominal operation is necessary, this is much better done after the closure of the diaphragm and pleura.

VONCKEN finds that about 20 per cent of abdominal wounds are accompanied by a concomitant thoracic wound. Thirty such cases have been treated in his service. The mortality varies from 50 to 60 per cent. Voncken thinks the transpleural approach to an injury of the diaphragm is best when the costal opening allows the lesion to be seen, and in such cases it suffices to enlarge or regularize this traumatic opening. This route is also preferable to the abdominal when the diaphragm rupture is situated on the posterior face of the dome, as it permits good access to posterior lesions of abdominal organs.

DUVAL prefers a combined thoraco-abdominal incision, practically a thoracolaparotomy. He operated upon 5 cases in this way with a successful result in all.

The Congress adopted these conclusions:

1. In thoraco-abdominal wounds injury to the diagphragm constitutes the specific factor of the lesion. The wounds of the thoracic and abdominal organs present nothing special from the anatomical point of view.

2. It is difficult to recognize hernia of the abdominal organs clinically. Radioscopic examination by showing the displacement of the heart to the right is a diagnostic sign of which account should be taken, especailly for left hæmothorax.

3. Operative indications are nearly absolute, exception being made for those cases in which a very small projectile involves only the high part of the abdomen, and especially the right. Perforation of the diaphragm of itself calls for suture, apart from any operative indications on the part of the thorax and abdomen.

4. The transpleural thoracic route is the most advantageous for inspection of the lesions, for the treatment of the pleural cavity, and for repair of the diaphragm rupture. It permits the treatment of the lesions of the subdiaphragmatic abdominal organs, herniæ or other injuries.

5. A separate laparotomy may also be indicated.

6. Thoracolaparotomy permits ample treatment of the thoracic and abdominal lesions at the one time.

W. A. BRENNAN

ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Barthelemy, Marlot and Jeanneney: The Advantages of Early Secondary Suture of War Wounds (Note sur les avantages de la suture secondaire précoce des plaies de guerre). *Bull. et mêm. Soc. de chir. de Par.*, 1918, xliv, 7.

The authors have practiced early secondary suture of wounds in 40 cases. When all inflammation has disappeared and all necrotic tissue removed they make an incision circumscribing the ulcerated surface in healthy skin about 5 mm. distant from the edge of the wound. The incision is deepened to the aponeurotic layer and the whole block is removed like a tumor. The operative field is then thoroughly disinfected with ether. If traction is necessary to draw the edges of the new wound together, the bistoury is used freely to strip subcutaneously until an easy approximation is obtained. Complete suture is then done, especially at the angles of the wound. The dressings are renewed after forty-eight hours. Latent infection may break out and must be watched for. Small local pus collections must be emptied and a little ether injected.

The results have been as follows: In 26 cases, primary union was very rapid, in 15 days at least; in 11 cases rapid union took place in spite of some suppuration about some of the stitches. Exceptionally this lasts one month. In 2 cases results were only fair, due to a faulty technique. One case was a failure because the excision was not sufficient.

In one of these cases, in which there was a large wound of the soft parts of the left subscapular region 18 cm. long, recovery was by first intention in eight days.

In general, complete recovery has been obtained in from fifteen days to a month. Suture can ordinarily be done within fifteen days after the man enters the hospital. The final cicatrices are supple, solid, non-adherent, and in every way quite satisfactory. W. A. Brennan.

Maddox, R. D.: The Maddox Orthopedic Frame. *Am. J. Surg.*, 1918, xxxii, 68.

The author describes an apparatus for the application of jackets, spicas, and all other plaster dressings. The whole apparatus can be placed in a hand-case and weighs complete about forty-five pounds.

This frame will accomplish the same results as the larger stable orthopedic frames, and while of original design, involves no new principles in the application of plaster-of-Paris dressings. It is simply a mechanical adaptation of the best principles of the ordinary apparatus, simplified so that it can be taken apart and packed in a compact case.

In addition to the above, it can be used to provide necessary parts for bed traction apparatus. It is just as adaptable to adults as to children, and when its possibilities and use are thoroughly understood, this orthopedic frame should prove to be a very valuable apparatus.

Davis, N., and Owens, R.: Pituitrin; Its Value in Postoperative Treatment. *N. Orl. M. & S. J.*, 1918, lxx, 712.

The fear of postoperative nausea, vomiting, and gas pains deters many from submitting to abdominal operation. The gas pain problem has been solved by the use of pituitrin hypodermically.

The method used is as follows: the administration of morphine, gr. 1/6, and atropine, gr. 1/180, hypodermically one hour before operation. Immediately after operation the administration of one ccm. of pituitrin hypodermically. This same dose is repeated in two hours; two hours later, 1/2 ccm. and four hours later another 1/2 ccm. Where too much handling of the viscera has not occurred, no more pituitrin is given; but in severe operations, doses of 1/2 ccm. are continued every four hours until twenty-four hours following operation. Twenty-four hours after operation 3 gr. of calomel in 1/2 gr. doses are given every half hour, followed by a saline cathartic.

A series of 126 cases are reviewed, of which 104 were non-septic and 22 septic. In addition they encountered 9 cases of eclampsia in which treatment as outlined was given, but over a longer period of time. In these cases it was noted that the urine output commenced earlier and was less scanty.

From their series of cases, the conclusions are drawn: (1) Pituitrin is a valuable drug in stimulating the muscular coat of the intestine after abdominal section in non-septic cases. (2) It is of decided aid in preventing postoperative shock in non-septic cases of abdominal section, as evidenced by lack of rise of temperature or pulse-rate. (3) It does not appear to have any influence in cases complicated with septic peritonitis. (4) It stimulates the secretory activity of the kidneys in eclampsia. (5) It materially reduces the postoperative suffering. I. E. Bishkow.

ASEPTIC AND ANTISEPTIC SURGERY

Sweet, J. E., and Hodge, E. B.: Further Experiences with Dakin's Dichloramin-T in the Treatment of War Wounds. *J. Am. M. Ass.*, 1918, lxx, 605.

The authors present the results of more extended experiences with this antiseptic, limiting this report to their own service, although the same method has been used in a greater number of severe cases treated and classified in a general way; only the surgical failures are here discussed. In no sense whatever was the material chosen. The patients remained at the hospital only until they were in fit condition for evacuation.

Of the cases, thirty were amputation stumps, not including amputations distal to wrist or ankle; 94 were compound fractures of the upper extremity, of which 40 involved the humerus; 78 were compound fractures of the lower extremity, of which 27 involved the femur; 31 were severe buttock wounds; 131 were severe wounds of the lower extremity, without fracture; 34 were severe flesh wounds of the back; 82 were severe miscellaneous wounds, of the head, face, neck, etc.

Two patients died of anaerobic septicæmia, two from infected foreign bodies in the brain, one from septic peritonitis six hours after admission, one from bronchopneumonia twenty-four hours after admission, three of traumatic meningitis, one of septicæmia, one of pyæmia, one of œdema of the lungs. Two amputations have been performed; in both instances the patients were admitted with symptoms of simple gangrene due to the destruction of the vessels of the leg by shrapnel. They have had one case of long-continued sepsis due to a wound of the knee-joint. Secondary hæmorrhages have occurred in five cases.

Bacteriologic studies of wounds have been made. Secondary closures have been practiced in a few cases. The length of time required for the sterilization of a wound depends, the authors believe, upon the extent of the infection and the character of the micro-organisms present. E. C. ROBITSHEK.

Pearson, W.: Clinical Observations on the Effects of Flavine in Wound Treatment. *Lancet*, Lond., 1918, cxciv, 370.

This paper is an official report on the effects of flavine used in a series of cases at a war hospital. Flavine had previously been used in this same hospital by Prideaux and abandoned because of the unfavorable results The clinical observations of these two men are in agreement. This report is of value because of the negative findings and the adverse criticism offered.

A 1:1,000 solution of acriflavine in sterilized normal saline was used in all cases. It was employed as a lotion for irrigating the wounds at each change of the dressings and also in gauze packs placed in the wounds and outer dressings. Dressings and packs were changed from one to three times in twenty-four hours.

Numerous cases were used as controls during these observations and in some instances it was possible to treat one or two wounds with flavine and other similar wounds on the same patient with normal saline or boric solution.

No cases were received early enough to try the prophylactic value of flavine; but two groups of patients were selected; first, those in whose wounds sepsis was active; and second, those in which sepsis had been controlled and repair had already begun. In the first group of cases it was concluded that flavine has no influence on local reactions nor on the character of the discharge following operation, and the rate at which granulations first made their appearance was not affected by flavine; but the granulations which did form were pale and gelatinous in appearance.

In the second group of cases it was noted that necrotic shreds, sloughs, etc., appeared tough and leathery and their separation from healthy tissue was so obviously delayed that treatment with normal saline or boric solution was substituted with immediate good results.

In several wounds where healthy, bright pink granulations had formed and were almost ready for secondary suture or skin grafting, the effect was injurious and in three to five days had changed for the worse.

In concluding the article, the author states that he has entirely abandoned the use of flavine in his work. P. W. SWEET.

Blair, A.: Two Years' Experience of Septic Wounds in a V. A. D. Hospital. *Brit. M. J.*, 1918, i, 169.

The great majority of wounds seen in a V. A. D. hospital are septic and have been treated at the military hospital with indifferent success. Many of the wounds are very foul and many have been operated upon for the removal of bullets, fragments of shell and necrosed bone. The most intractable cases have been wounds of the lower limb with infection of bone or wounds in or about the knee-joint.

Conservative treatment is the aim at the hospital with as little operative interference as possible. The patients are given a generous diet and kept in the open air as much as possible. Wherever a foreign body is present, it is removed and drainage established as soon as possible, and at times it has been necessary to re-open a wound or to re-amputate. Exposure of the wounds to direct sunlight has in almost all cases been followed by good results. Where there is stiffness or contraction, massage is a means of speeding up the healing process.

Many of the various antiseptics have been used with little difference in the results. Where there was a great sloughing of the parts, the damaged tissue that could be reached without much cutting was removed, a stream of warm hydrogen peroxide introduced into every part of the wound and drainage established. Where suppuration was profuse and there was swelling and redness of the parts, hot boric fomentations frequently gave good results.

Compound fractures, extensive frost-bite, and bad cases of trench foot did well when treated with the continuous antiseptic bath. Foul sinuses of long standing were treated with pure carbolic acid, then irrigated with hydrogen peroxide in a gentle stream, lightly covered with gauze and exposed to sunlight. Eusol, Dakin's solution, and "bipp" paste are all useful. However, the author's experience points to the superlative importance of sufficient drainage, while the antiseptic employed is of secondary importance.

The importance of rest is great; placing the injured part in a position of immobility was found the best method of treatment. Elastic pressure as recommended by Liek has given good results in wounds which remain open with weak, flabby granulations, especially where there has been extensive loss of tissue in the neighborhood of the femur or tibia. V. C. HUNT.

Huguet, Barré, Simonin, and Fayol: Primary Suture of Wounds (Sutures primitives des plaies). *Bull. et mém. Soc. de chir. de Par.*, 1918, xliv, 362.

The authors report on 173 wounds treated by primary surgical cleansing and immediate suture under active fighting conditions necessitating rapid disposal of the wounded.

Of 52 wounds of the soft parts, there were 49 recoveries and 3 failures; of 21 fractures of various types, 17 recoveries, 4 failures; of 40 articular wounds, 35 recoveries, 4 failures; of 63 cranial wounds of all types, 63 recoveries.

In soft part wounds and bone lesions they remove the track of the projectile *en masse*, remove the projectile and bone chips, wash the healthy tissue left with ether, and suture, leaving a mesh drain for two days. In joint injuries the articulation is washed with ether and early mobilization established. In head cases even when there is a complete fracture and opening of the dura mater, they remove spicula, regularize the orifice, and after ether lavage make a firm reunion. W. A. BRENNAN.

Munroe, A. R., McGill, M. D., Fleming, A. G., and Janes, R. M.: Wound Flora in Relation to Secondary Suture. *Brit. M. J.*, 1918, i, 173.

The flora of all septic wounds consists of a conglomerate variety of bacteria: staphylococcus, streptococcus, pyocyaneus, the welchii group, and bacilli with end or central spores. On analyzing fifty cases of secondary suture it has been noted that in all failures the anaerobic culture showed there had previously been a very active infection. The cultures in some instances showed an active streptococcus and in others a spore-forming bacillus. In either instance even with a low bacterial count the wound broke down after secondary suture; where these were absent the wound remained closed after secondary suture.

Where the anaerobic culture shows a virulent infection, and where the culture shows spore-forming bacilli it would be advisable not to attempt secondary suture until the wound is absolutely sterile.

The bacterial count, while not an absolute guide, is of very considerable help, but most important is the particular bacteria present in a particular wound. Along with the streptococcus, the bacillus welchii is found almost constantly, the streptococcus being the most persistent. V. C. HUNT.

ANÆSTHETICS

Pol Coryllos: High and Low Spinal Anæsthesia with Novocaine as a Method of General Anæsthesia (L'anesthésie rachidienne, haute et basse, à la novocaine, comme procédé d'anesthésie générale). *Bull. et mém. Soc. de chir. de Par.*, 1918, xliv, 367.

During a part of 1917 the author who was attached to the French Medical Mission in Roumania worked with Jonnesco and hence had ample opportunity of studying the effects of his method of spinal anæsthesia. Coryllos is not enthusiastic about it. If low spinal anæsthesia, lumbar or dorsolumbar, gives excellent results, cervical or high dorsal anæsthesia causes respiratory complications, cyanosis, and there was 1 death in a series of 20 cases of mediocervical or dorsosuperior following injection of 25 mg. of stovaine mixed with 1 mg. of strychnine.

Coryllos has therefore replaced stovaine-strychnine by novocaine with the most fortunate results. He has used it in a series of 219 cases and is enthusiastic over its simplicity, innocuity, and the anæsthesia obtained.

The difference in the results lies in the substitution of novocaine alone, as Coryllos has never observed any harmful effects from high puncture of the cord anywhere between the fourth cervical and first lumbar vertebræ.

Mediocervical injection gives anæsthesia of the head and neck. Injection between the seventh cervical and first dorsal assures anæsthesia of the upper limbs, of the lower part of the neck and the upper part of the thorax. Dorsal puncture between the second and fourth dorsal vertebræ anæsthetizes the thorax and contained organs. Injection between the fourth dorsal and first lumbar obtains anæsthesia of the lower thorax and the whole abdomen. It is ideal for laparotomies. Finally, injection between the first and second lumbar vertebræ assures hypogastric, genital and lower limb anæsthesia. Sometimes a double regional puncture is necessary owing to the multiplicity of lesions. It was done in 8 cases.

The dosage is 10 cg., about 1 ccm., of a 10 per cent solution of novocaine for inferior dorsal and superior lumbar anæsthesia; 7 to 8 cg. for middle and upper dorsal; 5 to 6 cg. for mediocervical anæsthesia. When a double injection is made the dose ought not exceed 7 cg.

Coryllos used this anæsthetic in the following 219 operations: on the head and neck, 30; on the upper

limbs, 31; on the thorax, 19; on the abdomen, 22; on the femur, 8; on the lower limbs, 108. There was no accident or any other complication.

The article gave rise to a very animated discussion and the principal points brought out were: Chloroform and ether are dangerous in many ways and it is desirable that some newer anæsthetic agent should be employed; spinal anæsthesia is useful in war surgery; although the experience of many who had tried the Jonnesco method is mainly unfavorable, yet they are willing to admit that the faulty results were due to personal technique rather than to the method; finally, the facts regarding spinal anæsthesia, especially high injections, are not yet numerous enough to enable definite opinions to be expressed. W. A. BRENNAN.

Sollmann, T.: The Comparative Activity of Local Anæsthetics: Paralysis of Sensory Nerve Fibers; Anæsthesia of Frog-Skin; Anæsthesia of the Human Skin; General Conclusions. *J. Pharmacol. & Exp. Therap.*, 1918, xi, 1, 9, 69.

The efficiency of local anæsthetics on the sensory fibers of nerve-trunks the author considers of greater practical importance than their efficiency on the motor fibers. However, it can be measured in animals only by the transmission of reflexes, which introduced complicating factors.

This principle was first used on mammals by Pototzky in 1903, under Biberfeld. He exposed the sciatic or brachial nerve of rabbits or dogs for some distance, sprinkled it with the anæsthetic in substance, and repeated the stimulation in five-minute intervals, noting the time of paralysis. The method was not quantitative since the concentration of the anæsthetic was unknown.

The method was again tried by Fromherz in 1914. However, he employed solutions and instead of determining the time of paralysis, which was variable, he determined the concentration required for complete anæsthesia. His animals had received morphine, 10 to 15 mgm. per kilogram of body weight. He applied the method to phenyl urethane derivatives, which have no interest in this connection.

He also made some experiments with novocaine and cocaine and concluded that much lower concentrations were effective than those required when these anæsthetics were applied to the frog's foot or to the cornea. No investigation appears to have been published in which the method had been applied systematically to frogs, as in the present work.

The frogs were decapitated, leaving the lower jaw. A transverse section was made through the abdomen just below the sternum, comprising about two-thirds of the circumference. The viscera were removed through this opening. The frogs were suspended by the lower jaw, and the eviscerated body cavity, which formed a little pocket, was filled with pledgets of cotton saturated with the anæsthetic solution, and then a further quantity of the solution was poured in to insure thorough saturation. In a series of six tables the author gives in detail the results of his experiments, and draws the following conclusions:

The activity on sensory nerve fibers was studied by applying the anæsthetics to the sciatic plexus and observing the presence or absence of reflex response to stimulation of the foot.

Cocaine, novocaine and tropacocaine hydrochlorides were about equally efficient. The efficiency of potassium, alypin, quinine urea, and especially antipyrine, was smaller; and their efficiency ratio in comparison with cocaine was lower than for motor fibers.

Alkalization increased the efficiency of the organic anæsthetic from two to eight times, the increase being generally about one-half as much as for motor fibers.

Epinephrin did not increase the efficiency, this result being the same as with the motor fibers.

Mixtures of cocaine with novocaine hydrochloride or with quinine urea hydrochloride gave simple summation without potentiation, just as with the motor fibers.

Mixtures of the anæsthetics with potassium did not show potentiation, differing in this respect from motor fibers. Apparently, therefore, the sensory fibers showed some important differences from motor fibers in their response to local anæsthetics.

In investigating the anæsthesia of frog-skin, the application of the anæsthetic solution involved penetration, as well as the action on the finer sensory nerves. In view of the physiological similarity of the frog-skin to mucous membranes, the method approached clinical surface anæsthesia. It was simplified, however, since the removal of the drug by absorption was minimized through destruction of the circulation.

In practicing this method the anæsthetic was usually applied to the skin of the frog's foot; the existence of anæsthesia was ascertained by observing the presence or absence of reflex response to sensory stimulation of the foot. The frogs were decapitated, leaving the lower jaw. The heart was excised. The frogs were suspended from the jaw. Each leg was immersed in a homœopathic vial containing 6 to 8 ccm. of the anæsthetic solution, reaching about midway to the knees. A cuff of adhesive plaster about both thighs prevented the frog from removing its legs from the solution.

At the end of every ten minutes the legs were withdrawn and the foot immersed in $\frac{U}{10}$ HCl. If the animal reacted by sharply jerking the foot from the acid, the leg was washed in water and replaced in the solution, this procedure being repeated every ten minutes during an hour or until the paralysis was completed. Intactness of the reflex centers was confirmed by applying the acid to the leg above the level of the immersion.

The author has compiled a series of tables showing the results of his investigations. He makes the following conclusions:

The application of the anæsthetics to the skin of the frog's foot approached the conditions of surface anæsthesia, involving penetration of the drug as well as action on the sensory fibers, but was somewhat simplified by doing away with the absorptive removal of the drug. The results differed in some important respects from those of direct immersion.

The efficiency ratios for the frog-skin were different for prompt and for slow anæsthesia. Cocaine, alypin and tropacocaine made the best showing. Novocaine was relatively less efficient than for conduction anæsthesia; potassium, quinine urea and antipyrine made a very poor showing for fast anæsthesia; much better for slow anæsthesia.

Alkali increased the efficiency even more than for immersion.

Epinephrin did not increase the efficiency.

Mixtures of cocaine with novocaine or quinine did not potentiate; nor did mixtures of potassium with cocaine or novocaine.

In investigating anæsthesia of the human skin, the local anæsthesia of the wheals produced by the intracutaneous injection of the anæsthetics involves the finest nerve fibrils, and possibly the sensory endings, and therefore minimizes the complicating factor of penetration, which renders it very suitable for the comparison of the absolute anæsthetic power. However, the drugs disappear fairly rapidly by systemic absorption, but this may be avoided, either by confining the observations to short intervals, or by combining the drugs with epinephrin.

The end-point, the absence of sensation, is somewhat subjective and not very delicate; but its accuracy is about that of the other methods and sufficient for practical purposes. The method is therefore the best for comparing absolute anæsthetic efficiency. It has the added advantage that its results can be transferred directly to a clinical use, namely, superficial infiltration anæsthesia; and it approaches quite closely the conditions of intraneural and conduction anæsthesia. It cannot be applied to surface anæsthesia. Because of these advantages, Sollman states, the wheal or Quaddel test is being used quite extensively since its introduction by certain investigators.

The author has made up a series of tables in this article giving the results in more or less detail, and from his investigations he makes the following conclusions:

The wheal method on the human subject gave probably the nearest approach to the absolute anæsthetic power. Its results were applied directly to injection anæsthesia, but not to surface anæsthesia. For the latter, the corneal test was the most suitable.

The suitability of the different anæsthetics for these two types of anæsthesia is shown in one of the tables. For injection anæsthesia, cocaine, novocaine, tropacocaine and alypin were about equally efficient; beta-eucaine was one-half and quinine-urea was one-fourth as active; apothesin, antipyrine and potassium chloride being one-eighth as active.

There were fairly large differences in the duration of action; but these differences were insignificant when compared with the differences that were produced by the addition of epinephrin.

The addition of sodium bicarbonate to cocaine or novocaine did not increase the activity. It was therefore not useful, in contrast to surface or intraneural anæsthesia.

The addition of epinephrin prolonged the action very greatly, except with tropacocaine. The epinephrin did not, however, change the minimal efficient concentration.

Mixtures of cocaine, novocaine and quinine-urea hydrochlorides gave somewhat deficient summation without potentiation. There was, therefore, no advantage in such mixtures.

Mixtures of the anæsthetics with potassium sulphate gave only simple summation. There was some advantage in reducing the required amount of the anæsthetic, the conditions being more favorable than with mucous membranes, which gave not even summation; but too much should not be expected from the potassium mixtures.

GEORGE E. BEILBY.

SURGERY OF THE HEAD AND NECK

HEAD

Armitage, H. M.: Blood-Pressure in Head Injuries. *N. Y. M. J.*, 1918, cvii, 250.

In the past few years several symptoms have been added as an aid in the diagnosis of borderline cases of compression, concussion and contusion: a high systolic blood-pressure during the third stage of cerebral compression, the findings of the ophthalmoscope, and increased pressure of the cerebrospinal fluid at lumbar puncture as registered by the spinal mercurial manometer.

The ophthalmoscope is of value after the first six hours. The diagnosis of increased intracranial pressure before medullary involvement has taken place by increased pressure as ascertained by the spinal mercurial manometer has been found fallacious by many investigators. In fractures of the base it has been the author's experience that blood-pressure readings are of no diagnostic value. This is due to the fact that in widespread hæmmorrhages, bulbar symptoms may not occur until late.

Kocher's description of the various stages of compression show that the symptoms are the result of circulatory disturbances, i.e., a primary venous stasis, resulting in capillary anæmia. It shows also that anæmia of the medulla elicits the so-called bulbar symptoms of decompression.

The systolic pressure in traumatic compression is in the large majority of cases increased, but not enough in the early stages to be of diagnostic value. The pulse-pressure is of importance, however, as is also the diastolic pressure. A high pulse-pressure is present early in cases of compression, and as the compression continues, the pulse becomes higher and the pulse-rate lower. The relation of the pulse-pressure to the pulse-rate and to the diastolic and systolic pressures must be studied and will prove a valuable aid in diagnosis, taken together with the entire group of symptoms. I. E. BISHKOW.

Sobotky, I.: Severance of the Chorda Tympani Nerve. *Boston M. & S. J.*, 1918, clxxviii, 224.

The author reports a case in which a paracentesis was done for a right acute otitis media, following which the patient experienced a numbness of the right side of the tongue and a loss of taste sensation on that side. Examination of the left ear showed the chorda tympani nerve to be located lower than usual and the assumption was made that the corresponding right nerve was severed. Tests with solutions showed no taste in the anterior half to two-thirds of the tongue on the right, except possibly at the very tip. Taste was present on the right posterior third. H. H. FREILICH.

Ortali, O.: A Plastic Method in Wounds of the Superior Longitudinal Sinus (Processo di plastica in ferite del seno longitudinale superiore). *Gazz. d. osp. e d. clin.*, Milano, 1917, xxxviii, 1293.

Ortali reviews the current methods of dealing with hæmorrhage from the sinuses in the case of cranial wounds. In extensive wounds of the superior walls of the longitudinal sinus, and especially in the posterior zone where there is confluence of the various sinuses, he finds that hæmostasis by the ordinary methods of tamponade, ligature, etc., is insufficient, as well as difficult to execute.

While in general the use of aponeurotic muscle strips as counseled by Horsley and others appears favorable, the author prefers to use epicranial aponeurosis in this particular class of injuries. The strip is cut in the vicinity of the lesion, the periosteum being preserved. It is pediculated and sufficiently large to cover the sinus lesion and is fixed by a few catgut or silk sutures. A successful case is described. The author claims rapid and safe hæmostasis, with preservation of the permeability of the vessel. W. A. BRENNAN.

Vanderbossche, A.: Gunshot Cranial and Cerebral Wounds (Plaies du crâne et du cerveau par projectiles de guerre). *Bull. et mém. Soc. de chir. de Par.*, 1918, xliv, 131.

Vanderbossche has operated in 92 cases of cranial and cerebral injuries since the beginning of the war, mostly in Servia and Macedonia, where, because transportation facilities were poor, the cases were mostly late in arriving and advanced in infection. He has had a mortality of 39 per cent; but meningo-encephalitis, abscess, or cerebral hernia were in full development in the majority of those cases when received for treatment.

Vanderbossche's views regarding the evolution and early operative treatment of cerebral and cranial injuries generally coincide with those expounded by other war surgeons. These late treated infected cases after operation are left open, loosely tamponed with gauze soaked in oxygenated water, the angles of the incision being sutured. Drainage is indispensable in the case of cerebral abscesses. The rubber drain seems to suit best, but it is difficult to fix it properly so that it will neither become enmeshed in the cerebral tissue nor expelled. It may be necessary to place the patient in ventral or lateral decubitus, according to the situation of the wound, in order to drain properly.

The author does not think that cerebral hernia is the result of strangulation of a portion of the inflamed cerebral tissue by the meningocranial ring. Autopsies have shown him that the hernia is only the exterior evidence of a deep septic brain process. It is a mechanical phenomenon of deep pressure. He therefore thinks that liberation, even section of the hernia, with the object of draining the subjacent septic area is the proper treatment of rebellious progressive cases.

The author gives short histories of 24 cases which he has been able to trace, some of which were treated in 1914. W. A. BRENNAN.

Schwartz, A., and Mocquot, P.: Cranial Wounds in Ambulance Service at the Front (Les plaies de crâne dans les ambulances l'Avant). *Rev. de chir.*, Par., 1917, liii, 50.

The authors review a large number of cranial wounds treated in their surgical ambulance service.

Trepanations are done as far as possible under local anæsthesia, as it has the advantage of avoiding operative shock. The extent of operation or its depth offers no obstacles. General anæsthesia is confined to the semicomatose or those highly excited or with some other marked contra-indication.

The authors prefer an H-incision. A semicircular incision is confined to wounds in the temporal region, to small punctiform wounds, or to such lesions as do not call for extensive drainage. The H-incision is made with the transverse branch long, corresponding to the major axis of the wound. The perpendicular branches can be lengthened later if necessary. The incision gives better light and can always be enlarged; it permits easy approximation later with a good cicatrix. The operation then depends on what is found, whether a fracture, an intact or open dura, etc.

Although it is the author's general practice to respect an intact dura, yet there are some rare conditions which indicate its surgical opening. These are shown either by the clinical symptoms or the local aspect. The clinical symptoms are signs of cerebral compression, coma with stertor, slow pulse, dilatation of pupils, etc. The local aspect is

either the bluish tint of the dura suggesting the existence of a blood-clot, or the absence of fluctuation. Opening of the dura is only justifiable if the wound is aseptic.

When the dura is found open and meningeal vessels bleeding, careful hæmostasis is necessary, but may be very difficult. The authors have found it best to ligate in the regions of the superior longitudinal and sphenoparietal sinuses. Other methods have not given them good results.

With regard to the removal of intracerebral projectiles, those of small volume or those situated in the hemisphere corresponding to the entry orifice should be removed under control of the X-ray.

The authors give a statistical table of their results from July, 1915, to April, 1916. W. A. BRENNAN.

Murand, I.: Statistics of Cranial Wounds with Results After One Year (Statisque de plaies du crâne avec résultats après un an). *Lyon chirurg.*, 1917, xiv, 810.

The author gives the end-results of 40 trepanations for cranial wounds. There were 21 recoveries and 19 deaths in from twelve to sixteen months after recovery. Of the 19 deaths, 10 occurred during the first twenty days after intervention; 6 during the second month, and 3 within six months. Mortality is highest during the first month, and if there is survival for three months, the ultimate prognosis as regards life is good.

Of the 21 surviving cases, 1 has suppurative frontal sinusitis. Nine of these cases had the dura injured with issue of brain matter in 6 cases. The author thinks that the gravity of the prognosis is less a factor of dural injury than of the presence of intracerebral projectiles. Of those recovered, 10 show some persistence of headache, tingling, etc. The author thinks that such troubles might easily improve if a proper plastic operation on the cicatrix were done. Motor and sensory troubles disappear soon after operation; but those due to cerebral lesions, paralysis and paresis, take more time.

W. A. BRENNAN.

Le Fur, R.: Operative Technique and Results of Osseous Cranioplasty (Technique opératoire et résultats de la cranioplastie osseuse). *Presse méd.*, Par., 1918, xxvi, 153.

Le Fur describes a new method of repairing extensive losses in cranial bone by "dedoubling" the cranial wall in the immediate vicinity and turning it over so as to cover the breach. The edge of the breach serves as a hinge.

An H-incision is made over the defect and all the cutaneous cicatricial tissue removed without opening the meninges. The fibrous tissue covering the meninges or brain is delicately removed; if any hernia exists it is reduced. The bone graft is then cut by incising into the thickness of the cranial wall adjoining the defect to be covered, until a piece a little larger than this defect is mapped out. The bone is then "dedoubled" or slit in two, working through it with a Macewen chisel from the edge of the incision toward the edge of the breach but leaving a thin border along the edge of the breach. When the graft is freed it is held only by this thin edge. It is then reversed and turned down over the breach so that the periosteum is beneath. The free edge is then sutured with fine catgut to the periosteum around the edge of the breach which is first liberated all around except at the hinged edge, so that the graft edge can be slipped under it.

Le Fur has proceeded in this way in 37 cases, 6 of them with a breach over 7 cm. in diameter, and others with large herniæ. There has been 1 death, due to infection three weeks after operation. In this case the hole was more than 10 cm. long.

The local results are ordinarily very satisfactory. The general and functional results are not always so perfect. Generally the functional troubles which exist before cranioplasty persist after it. In no case has Le Fur observed any aggravation of these, and in many cases there was some improvement.

This method of cranioplasty is a certain means to avoid cerebral compression and Le Fur thinks that on this score it has a distinct place in cranial surgery.

W. A. BRENNAN.

Moutier, F.: Hypertension and Death from Acute Pulmonary Œdema in Patients with Cranio-Encephalic Wounds (Hypertension et mort par œdème pulmonaire aigu chez les blessés cranio-encéphaliques). *Presse méd.*, Par., 1918, xxvi, 108.

Moutier has observed that in a number of cases of patients with cranio-encephalic wounds, death occurred not from the local effects of the cerebral trauma, not from any posthæmorrhagic anæmia, but from a superacute pulmonary œdema. The clinical picture is very dramatic. In investigating the matter, Moutier finds the key in a recent memoir of Rogers on the functions of the suprarenal capsules. In this it was shown that experimental cerebral embolism provokes marked and lasting arterial hypertension. Animals in whose veins relatively high doses of adrenalin have been injected die from acute pulmonary œdema. It creates such a tracheo-pulmonary hypersecretion that the fluid issues in waves through the mouth and nostrils. Death occurs by rapid asphyxia.

Moutier describes three of the cases which he observed with cranio-encephalic bullet wounds, all of which died within twenty hours of acute pulmonary œdema.

The author therefore concludes that in certain cranio-encephalic wounds the immediate menace is from the lung and not from the brain. Death may result within twenty-four hours from pathologic hyperactivity of the suprarenal capsules. This hyperepinephria brings on an increasing hypertension, and the very marked increase in pressure denotes a specific vasoconstriction.

Moutier draws attention to therapeutic errors which ought not to occur at the present time. He alludes to the use of injections of strong doses, 1

milligram for example, of adrenalin and especially the employment of adrenalized serum, which are in general vogue. It is an extremely dangerous practice. The use of adrenalin should be reserved or even not employed in the case of cranio-encephalic wounds, when it is particularly dangerous.

W. A. BRENNAN.

McLean, S. H.: A Piece of Steel in the Brain Eighteen Years. *South. M. J.*, 1918, xi, 245.

The patient, a school teacher, gave the following history:

When five years of age she was preparing to attend an entertainment in the neighborhood, and on getting into the vehicle she switched the horse's tail and in return received a kick in the head, causing a depressed fracture. They sent for a physician twelve miles away, and he arrived about midnight; he took the child into the kitchen and with all the coal-oil lights available began to attempt to raise the skull. The mother remarked to the doctor, "You have broken off your knife," to which he replied, "Yes, but it must have fallen on the floor." It was never found.

After a rather stormy recovery of about six weeks, the child was able to be about and gradually regained her normal health, but with a considerable depression in the skull at the edge of the hair. This gave no trouble until she was twenty-three years old, when she began to have headaches and a little tenderness over the depressed area, and slight twitching in the foot and leg which rapidly grew worse in the next few months.

The author operated the following day over the center of the depression, removing with a trepan a button a little less than the size of a half dollar, turning the flap of skin and fascia from above downward so as to place the scar of the incision in the hair. On removing the bone, instead of a knife blade, there was found a blade of a large pair of forceps, two and a half inches in length, lying between the dura and skull. It may have been polished at the time of entrance, but now it was like a piece of steel with no polish.

She left the hospital on the eighth day free from any twitching or pain. This was in October, 1915. The author saw her a short time ago, a little over two years since operation, and found her in perfect health and carrying on her vocation as usual.

E. C. ROBITSHEK.

Rayner, H. H., and Barclay, A. E.: Note on the Extraction of a Foreign Body from the Brain. *Brit. M. J.*, 1918, i, 226.

The damage done to the brain structures in the removal of a foreign body, coupled with the fact that fragments lodged in the brain may give rise to very little disability, argues for leaving deep-seated ones in position until such a time as it becomes evident that their presence is the cause of symptoms, and that removal, if possible, will lead to improvement.

The author reports a case, a man wounded February 7, 1917. The signs and symptoms suggested a subcortical lesion in the right rolandic area, and the X-ray confirmed this by showing a foreign body in the suspected region. The patient was kept under observation for three months; he gradually became worse and was operated upon June 26, 1917. Removal of the foreign body was accomplished in the X-ray room by application of an extractor over the shadow of the foreign body. Recovery of the patient was quite slow but seemingly satisfactory.

The extractor is made like a pair of dental forceps, the jaws being about one and one-half inches apart when closed. Above the jaws is fitted a small fluorescent screen. Beaks or blades are fixed at right angles to the jaws and meet at the points, but are insulated from one another by a small fiber block let into one of the blades which is made slightly longer than the other. For brain work the blades are thin and close together, the point of the longer being rounded. The blades are connected with an electric bell through a relay that is specially fitted in order to avoid stimulation of structures when contact is made. When the blades are brought into correct relationship with the foreign body, contact is made and the bell rings. This indicates that by raising very slightly and opening the blades the foreign body can be picked up without any intervening structures being caught.

Protection is afforded by a sheet of heavy X-ray proof rubber placed either above or below the patient.

Only certain cases are suitable, that is, those in which access can be had to the foreign body directly in the line of the rays, and through soft structures, or with the assistance of a trephine. Old standing cases, surrounded by a fibrous capsule, are not suitable for extraction.

V. C. HUNT.

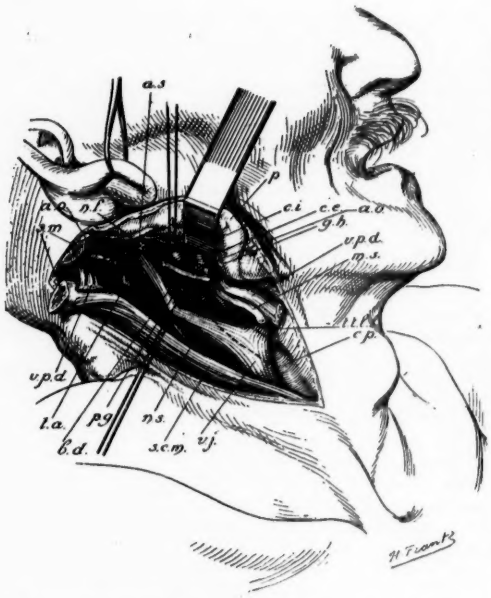
NECK

Costantini and Vigot: Treatment of Vascular Neck Wounds, Including the Branch Vessels (Traitement des blessures des gros vaisseaux du cou et de leurs branches). *Presse méd.*, Par., 1918, xxvi, 51.

The two clinical signs of a vascular neck injury are hæmatoma and hæmorrhage through the wound. Hæmatoma is always visible, but hæmorrhage may cease early and spontaneously. The object of surgery here is to find the injured vessel and ligate it. This can be done without causing unnecessary hæmorrhage if one has sufficient anatomical knowledge of the neck region.

If the carotids are attacked, the primary carotid is constricted with a catgut band below the region of injury; if the jugular is involved, the jugular will be constricted above the site of injury. The maneuver will in either case be done after tamponade of the vascular wound with compresses.

If the wound is situated above the thyro-linguo-facial trunks, after tamponing the wound it is



P, parotid; nf, facial nerve; sm, sections of mastoid; ao, occipital artery divided and ligated; scm, sterno-cleido-mastoid; vpd, posterior belly of the digastric; as, stylo-mastoid process; ms, stylohyoid muscle pulled aside; vj, jugular vein; ttlf, thyro-linguo-facial trunk; cp, primary carotid; ce, external carotid; ci, internal carotid; gh, inferior hypoglossal; bd, descending ramus; pg, vagus; ns, spinal nerve; ta, tubercle of the atlas. (Costantini and Vigot).

necessary to ligate the thyro-linguo-facial trunk and to find the lateral sinus behind the mastoid and compress it.

To discover whether all the regions traversed by the jugular and carotid could be approached and explored without irreparable damage, the authors have made experiments on cadavers and find, contrary to what is currently taught, that the jugular and carotid vessels can be followed and explored as far as the base of the skull, provided that rigorous hæmostasis is practised at a point sufficiently far removed. To realize this essential condition, an incision is made 0.5 cm. behind the anterior edge of the sterno-cleido-mastoid and following this edge. The incision ascends until under the lobule of the ear, which is pulled up by hook forceps. Below the incision reaches the superior edge of the thyroid cartilage. Another incision is made near the upper extremity of the first, branching toward the region of the lateral sinus.

The accompanying illustration and legend explains the subsequent steps which make it possible to ligate the internal jugular near the gulf and the carotid near the base of the skull so that a prophylactic hæmostasis is assured at as ideal a distance as possible. If the lesion is arterial, the ligature will be placed on the primary carotid or even the internal carotid. If the lesion is venous, Patel's operation will be done, using the mastoid incision to lay bare the lateral sinus and compress it.

The authors have performed seven operations on the cervical vessels, with six subsequent recoveries.

W. A. BRENNAN.

Buscarlet, F.: Suppurative Thyroiditis; a Complication of Gonorrhœa (Thyroïdite suppurée; complication de la blennorragie). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 2286.

The author describes a very rare complication of gonorrhœa in a man of forty-six years, a case of suppurative thyroiditis accompanied by suffocation. There was an intermittent urethral discharge. During the periods in which the urethral discharge ceased there were attacks of fever with manifestations of compression in the neck and a swelling which finally reached a phlegmonous stage.

A hard painful thyroid tumor developed which on incision yielded abundant brownish oily pus. Some weeks later the patient's symptoms of cystitis and urethritis cleared up and the neck became normal. The author was unable to make an analysis of the pus.

W. A. BRENNAN.

Gatch, W. D.: Some Observations on the Surgery of the Thyroid Gland. *J. Indiana St. M. Ass.*, 1918, xi, 13.

The paper is a series of observations on some phases of the surgery and pathology of the thyroid gland derived from a study of the personal cases in the light of recent literature.

Under adenomata of the thyroid the author calls attention to the fact that every possible combination of colloid, cystic, and fœtal characteristics may be found. In addition to causing pressure symptoms and deformity, these adenomata may be the cause of hyperthyroidism of any degree of intensity or they may be the origin of cancer. These two dangers make it plain that in most cases early removal of the adenoma is advisable. Treatment by the administration of iodine or thyroid extract is exceedingly dangerous. Two out of five such cases observed by the author died from hyperthyroidism shortly after entering the hospital.

The author has observed five cases of cancer of the thyroid, only one of which was operable. In this case there was recurrence four or five months after operation. The difficulty of distinguishing adenoma from cancer of the thyroid, even from histologic preparations, is discussed; cancer, Gatch believes, frequently if not always arises from the so-called fœtal adenoma.

The author discusses his experience with clinical means of estimating the degree of hyperthyroidism. He has found the basal metabolism test of Means and Aub too complicated and too subject to variation and error to be practical. The adrenalin skin

reaction of Goetsch on the other hand has been of very considerable service. In his hands it has denoted with accuracy whether or not hyperthyroidism was present. However, it cannot be relied upon to determine the proper time to operate upon a patient with severe thyrotoxic symptoms.

It is the author's experience that it is generally safe to operate when the pulse is faster than 100, provided there is no organic weakness of the heart. The electrocardiogram has proven of great value in estimating the functional capacity of the heart. When myocardial insufficiency exists, he takes the following precautions: more or less prolonged rest in bed before operation; the employment of an expert anæsthetist; deliberate and systematic operation with free exposure of the gland and scrupulous attention to hæmostasis; the removal of at least five-sixths of the gland. Gatch believes that local anæsthesia in these cases has no advantage over a carefully given general anæsthesia with preliminary medication with morphine carried out for several hours preceding the operation.

He removes the gland first by thoroughly exposing the lobe, tying its superior vessels and mobilizing it, then cutting across the isthmus and carefully freeing the lobe from the trachea; the lobe is then grasped between the fingers behind and the thumb in front in order to control the inferior thyroid artery while the lobe is cut away so as to leave only a thin layer of thyroid tissue posteriorly to protect the recurrent nerves and parathyroid bodies. The branches of the inferior thyroid artery are clamped as they are cut within this layer of thyroid tissue. At the conclusion of the operation the wound is thoroughly irrigated with normal salt solution and very free drainage is provided.

The postoperative treatment is much the same as the pre-operative. Alarming symptoms are met by the application of an ice bag to the heart and the administration of enough morphine to secure absolute comfort.

The contra-indications to operation in hyperthyroidism are advanced pulmonary tuberculosis, œdema of the feet, and ascites or other evidence of hopeless cardiac weakness and mania. The last is always a sign of impending death. When these complications are present, no surgical procedure should be undertaken because the inevitable fatal termination simply brings surgery into disrepute and prevents patients whom it is still possible to relieve from seeking assistance. ELLIS FISCHEL.

Krumbhaar, E. B.: Electrocardiographic Observations in Toxic Goiter. *Am. J. M. Sc.*, 1918, clv, 175.

The author studied the changes produced in the electrocardiogram by the intoxication of exophthalmic goiter and summarizes his results as follows:

1. Electrocardiographic studies have been made of 51 cases of goiter, mostly of the toxic type, in as many cases as possible both before and after surgical operation.

2. In the series of 47 patients that submitted to surgical operation 3 deaths occurred; 2 of these offered no premonitory signs in either clinical or electrocardiographic examination; in the third case the development of negative T waves might have served as an adequate warning.

3. Electrocardiograms, essentially normal as to form and rhythm, were found in 22 cases, or 43 per cent. Preponderating hypertrophy of the right ventricle or a tendency thereto was found in 11 cases, and of the left ventricle or a tendency thereto also in 11 cases. After operation, however, one-half of the right ventricular cases showed a diminished degree of preponderance, whereas all but one of the left ventricular cases showed either no change or an increased amount of preponderance.

4. Cardiac arrhythmia was found as follows: sinus arrhythmia, 4 cases; ventricular extrasystoles, 3 cases; auricular fibrillation, 3 cases; auricular flutter, 1 case; delayed conductivity, 2 cases. Two of the cases of fibrillation and the case of flutter proved constant over several years. The other case of fibrillation was of the transient kind and disappeared coincident with the improvement that followed medical treatment.

5. The T wave was found to be unusually prominent in most cases. In about half the cases it was markedly and persistently diminished after operation. This was found to be true to a lesser degree in postoperative cases with normal hearts. Other changes in the form of the ventricular complex after operation indicated an approximation to normal cardiac mechanism.

6. Blood-pressure estimation showed an increased pulse-pressure in most cases that was diminished with the improvement that followed surgical relief. Systolic pressure was also high in those cases that showed left ventricular preponderance, but never succeeded 170 mm. Hg.

His conclusions are:

1. In early cases of toxic goiter the characteristic tachycardia is not accompanied by any signs of myocardial change that are demonstrable with the string galvanometer.

2. With persisting overaction of the heart, hypertrophy of either ventricle may become manifest.

3. Progressive hypertrophy and overaction results in myocardial degeneration that may be manifested by any type of cardiac irregularity: sinus arrhythmia, premature contractions, auricular flutter, auricular fibrillation, heart-block, etc.

4. If the existing intoxication is the chief factor in the production of the arrhythmia, this may disappear with removal of the intoxication.

5. Successful treatment, whether medical or surgical, improves the cardiac condition by this means. This is shown not only by the occasional disappearance of an arrhythmia but also by diminution in the size of the T wave and in the pulse-pressure as well as by the general clinical condition.

6. The development of diphasic or inverted T waves, especially in leads I and II, should probably be considered as influencing prognosis unfavorably.

E. B. FREILICH.

Kocher, Roux, T., and Others: The Operative Treatment and Prophylaxis of Goiter (Ueber Kropfoperationen bei gewoehnlichen Kroepfen nebst Bemerkungen zur Kropfprophylaxis). *Cor.-Bl. f. schweiz. Aerzte*, 1917, xlvii, 1633.

At the annual meeting of the Swiss Surgical Association, held at Lausanne March 10, 1917, a discussion on goiter took place in which Kocher, Roux, De Quervain, Birch, Kopp and others joined.

With regard to hypothyrosis, Kocher said that the removal of only that part which is absolutely necessary to relieve pressure should be done, and as much as possible of the functioning gland should be left, avoiding ligature of the arteries if possible. With hyperthyrosis the functioning should be checked by ligating the main arteries, enucleating all diseased tissues but sparing the normal tissues. The whole gland should never be removed. In vascular and exophthalmic goiter it is best to ligate the arteries in two sittings.

In the past fifty years the mortality of goiter has been reduced from 30 per cent to 0.003.

For prophylaxis Kocher recommends adding a small amount of iodine to the drinking water in endemic goiter districts, which with hygienic measures will prevent the development of goiter conditions in children. Kocher quotes statistics to show that army service tends toward the retrogression of established goiter in recruits.

Roux gives a number of charts showing the increase in the number of goiter operations in Switzerland since 1870. Since that time postoperative mortality has dropped from 12.5 per cent to 0.66 per cent. In over twenty thousand cases operated upon in Switzerland, permanent injury of the recurrent nerve occurred in 1.22 per cent, and temporary injury in 0.81 per cent. The greatest postoperative danger was due to pneumonia; but this has almost been eliminated. W. A. BRENNAN.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Le Fort, R.: Thoracic Hernia of the Lung and Omentum; Repair of the Diaphragm and Closure of the Thorax by Aponeurotic and Fat Graft; Recovery (Hernie thoracique du poumon et de l'épiploon; réparation opératoire du diaphragme et fermeture du thorax par une greffe aponévrotique et graisseuse; guérison rapide). *Bull. et mém. Soc. de chir de Par.*, 1918, xliv, 95.

A soldier who had recovered from a bullet wound of the chest came to Le Fort with the diagnosis of pulmonary hernia. The entry and exit orifices had healed. There was a thoracic hernia on the left side the size of an orange. On exposure of the osteomuscular orifice by incision along the ribs, the hernia was found to be constituted by the omentum and abdominal organs protruding through a large diaphragmatic opening. Part of the lung also herniated.

On placing the patient in right lateral decubitus Le Fort was able to reduce the herniated organs. He found it possible by widening the intercostal breach to inspect the diaphragm and suture the very large orifice in it with catgut, making a complete abdominothoracic occlusion. A piece of aponeurotic fascia lata a little larger than the thoracic breach was cut from the thigh and wrapped in a compress moistened with warm serum. All subcutaneous fat tissue was left adherent to the graft. The thoracic orifice was 3 finger-widths long, 2 wide, and 1 deep. The graft was fixed in this orifice by eight catgut sutures, the fat tissue turned inward. The violent traumatopnœa, which was present until then, ceased completely. The operative wounds were closed and reunion was complete after eight days. Twenty-one days after operation the thoracic wall was solid and the patient in good condition.

Le Fort finds that hernia of the abdominal organs through the thoracic wall is not rare in war wounds.

W. A. BRENNAN.

Roux-Berger, J. L., and Policard, A.: Infection of the Pleura in Chest Wounds; Treatment of Old Suppurations with Pachypleuritis by Pleurectomy (L'infection de la plèvre dans les plaies de poitrine; le traitement des suppurations anciennes avec pachypleurite par le pleurectomie). *Lyon chirurg.*, 1917, xiv, 969.

In their long, well illustrated and exhaustive report the authors limit themselves to the study of severe and old cases of pleuropulmonary infections complicating war wounds. They consider the curative treatment of such complications extremely difficult, but preventive treatment is easy. In 18 of the 19 cases which form the basis of this report, development and aggravation of the infective complications were clearly traceable to absolute lack of knowledge of the mode of development of infection in pleural and pulmonary lesions. This misconception led either to a policy of abstention or to surgical treatment which was entirely insufficient.

Regarding lung wounds it must be admitted as a fundamental premise that the theory generally accepted in war surgery today is correct, namely, that all such wounds are infected; and that the spread of infection can only be prevented by early and complete operation. Therefore the surgical therapeutics to be applied in every chest wound

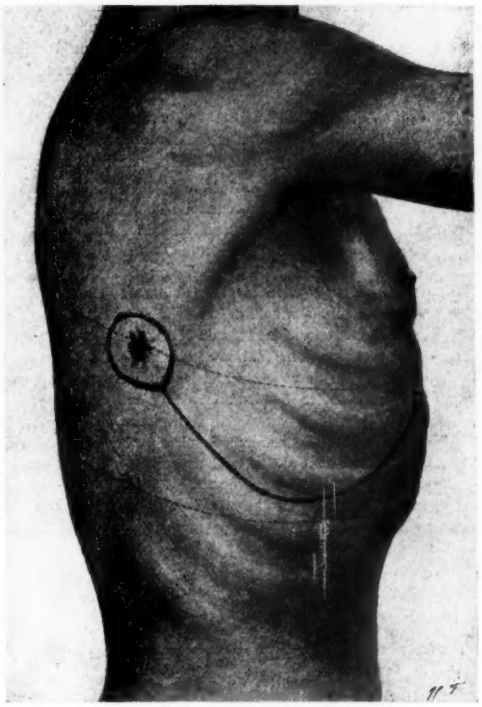


Fig. 1. (Roux-Berger and Policard.)

Fig. 2. (Roux-Berger and Policard.)

should be thorough and immediate. It should include: (1) complete removal of the fractured rib, when there is one, the infection of which close to the pleura is the principal cause of purulent pleurisy; (2) extraction of the projectile, whether situated in the pleura or in the lung; only very small projectiles or those situated very far from the orifice can be disregarded; (3) the lung should be sutured and the operative wound closed.

In the authors' 19 cases, a rib fracture, either unrecognized or untreated, was found in 16. Such a fracture, if not the essential factor, is almost constantly found in pleural infections.

The authors have observed that pulmonary infection develops quite independently of pleural infection. The latter is early and rapid. The lung offers a more protracted resistance. The authors think therefore that the immediate danger in wounds of the pleura and lungs, apart from hæmorrhage, arises from infection of the pleura. Later on when effective treatment has removed the cause of pleural infection, the pulmonary insidious and slower infection may continue and protract the condition. The authors therefore insist that the real treatment ought to be such as will prevent pleural infection.

When infection has been established for some time, a cure can hardly be hoped for and only incomplete and mediocre results are obtained. When prompt and thorough treatment is not applied, pleuropulmonary lesions develop, clinically characterized by cachexia and anatomically characterized by a noticeable thickening of the pleura, as well as by the constriction of the lung into a hard envelope and development of lung lesions of the acute bronchopneumonia type.

In fresh wounds of the lung and pleura, prophylactic treatment should follow the general rules of war surgery: resection of the entry and exit orifices and all adjacent tissue, systematic resection of fractured ribs, and minute extraction of foreign bodies, etc. The pleura should always be closed by hermetic muscular sutures. The surgical treatment of the lung itself is limited. Incision of the trajectory and wide resection of all contused tissues is not possible in the lung and hence ideal treatment is not possible. It is limited to the removal of the projectile and treatment of the entry and exit orifices.

In established chronic fistulous pleural suppurations the treatment must include: (1) removal of the infected fractured rib which has been either totally neglected or wrongly treated; (2) previous

Fig. 3. (Roux-Berger and Policard.)

Fig. 4. (Roux-Berger and Policard.)

drainage and disinfecting of the pleural cavity; (3) extensive removal of the parietal pleura; (4) decortication of the parietal and visceral pleura.

In some of their cases the authors tried parietal pleurectomy, in others visceral pleurectomy. The general results were good. They believe that parietal and visceral pleurectomy lose their value if one is applied without the other. The authors have therefore been led to adopt, when possible, total pleurectomy involving the resection of all the parietal pleura and all the visceral pleura in the vicinity of the suppurating cavity. Such pleural resection *en bloc* is only possible when the infected pocket is limited and does not extend to the top of the thorax. Their technique of total pleurectomy is in brief as follows:

The infected pocket is disinfected in the days immediately preceding the operation and its exact location obtained radioscopically. The incision must permit total and easy removal of this pocket.

Fig. 1. shows the incision preferred by the authors which includes the fistulous orifice.

Fig. 2 shows the pleuroparietal exposure. Two ribs are resected for a length of 20 cm. The amount of costal resection will be indicated by the extent of the pocket to be removed. Peeling off the thickened parietal pleura is done with the finger, from above downward. This is continued as far as necessitated by the limits of the pocket. When done, a Tuffier intercostal retractor is placed.

Fig. 3 shows the retractor in position and the pleuropulmonary decortication being continued on the exterior face of the lung. This is carried down to the diaphragm, and the infected pleural pocket, which is then only retained by the fistulous trajectory, is seized by a clamp.

Fig. 4 shows the extraction of the infected pocket and the fistulous tract by rib resection. The freed lung commences to expand. Any small tears in the parenchyma have been sutured.

The pleural cavity is dried, and the thoracic wall closed. If there is any evidence of pleural effusion, drainage is established. There is usually very little postoperative shock. When the important pachypleural lesions have been totally removed, the most serious obstacle to recovery will have been disposed of, but the fresh cavity in the pleura will have to be constantly drained as long as any signs of infection continue.

The authors carried out total pleurectomy in 4 of their cases. Two died later. In one of those cases autopsy showed total hepatization of the left lung and splenization of the lower half of the right lung, lesions which were hopeless. The other death was due to acute tuberculous bronchopneumonia a few months after operation. W. A. BRENNAN.

Spence, T. B.: Chronic Empyema. *Long Island M. J.*, 1918, xii, 41.

Some surgeons claim that chronic empyema should never occur, that cure of empyema should always be effected during the acute stage of the disease by applying the proper treatment at the proper time. The author states that improved methods have been sought in the conduct of empyema cases and that there should result no permanently collapsed lungs and no persistent pleural sinuses.

Lilienthal has done considerable work in this line and outlines the management of acute suppuration of the pleura. The important objects of the treatment are: (1) exploration of the pleural cavity; (2) mobilization of the lung. He does not mention as an important factor the evacuation of the pus and drainage; however, in critical cases a few days before operation a small incision is made for preliminary drainage.

In making the exploration of the pleural cavity, Lilienthal makes an incision in the seventh or eighth costal interspace extending from the angle of the ribs to the cartilage. The ribs are spread by a retractor and the contents of the cavity are inspected. Adhesions to the lungs are separated, sacculations are searched for and emptied.

Mobilization of the lung he finds necessary in certain cases, as early as ten days after the probable beginning of the empyema. The pleura may be covered with a grayish or greenish membranous exudate which obliterates every landmark. The chest cavity may not even show a bulging to indicate the location of the lung, as it lies compressed against the mediastinum, the spinal column, or the chest wall.

This exudate is incised, freed from the lung, and removed as far as possible. If the adhesions between the lung and the chest wall are not too strong, they also are freed. Drainage is introduced and the skin is sutured. Despite the improved methods and the greater skill and care that is exercised, one still sees cases of pyothorax that have resulted in a permanently collapsed lung, repeated accumulation of pus, or persistent sinuses.

The author has had no great success with Beck's bismuth paste.

In chronic empyema where there is considerable or complete collapse of the lung and a huge cavity lined with suppurating thickened pleura, the prognosis is very bad.

Estlander in 1877 attempted a solution of the surgical problem in these cases. Starting with the supposition that the lung was permanently disabled, he resected large portions of the ribs, thus making a flexible chest wall which could be pressed inward and be made to obliterate the cavity. Later he adopted a more complete procedure, resecting the intercostal muscles and parietal pleura and curetting the pleural covering of the lung. Schede worked out the details of such an operation a little more fully.

No further progress was made until Fowler in 1893, believing that the lungs could expand even after long compression, performed the operation of cutting away the thickened pleura lining, relieving the lung with complete success. Fowler called this operation decortication of the lung. This operation can in some cases be advantageously combined with the Estlander. Ransohoff was of the opinion that the same result could be obtained by making multiple incisions into the pleura. Hæmorrhage after these operations frequently proves serious.

The use of the blowing bottles greatly aids expansion of the lung. The patients are best up and about in the open air as soon as possible after the operation.

The author reports three cases, two operated upon with complete success and one resulting fatally. P. H. KREUSCHER.

Jeantelet: A Year of Artificial Pneumothorax (Une année de pneumothorax artificial). *Lyon méd.*, 1918, cxxvii, 29.

During the past year Jeantelet has carried out the Forlanini method of artificial pneumothorax, confining his treatment to men with unilateral lesions or with one side only very slightly and the other side markedly attacked. He was able to realize pneumothorax in 34 cases. He found 61.73 per cent of the cases much ameliorated. The time elapsed is still too short to report any permanent cures. Almost all the cases were in the ulcero-caseous stage.

The author thinks that the Forlanini method is much superior to all other methods of treatment in cases to which it applies. W. A. BRENNAN.

Dorlencourt and Pacheres: Researches on the Incoagulability of the Blood in Traumatic Hæmothorax (Recherches sur l'incoagulabilité du sang des hemothorax traumatiques). *Presse méd.*, Par., 1918, xxvi, 94.

The experimental researches of the authors have determined that the fluid in hæmothorax is not merely incoagulable but is also anticoagulant. If some hæmothorax fluid is added to fresh blood it makes it definitely incoagulable. The authors attribute the effects to some substance which is added to the blood during its stay in the pleura. This incoagulable substance is also found to have passed in small quantities into the general circulation. W. A. BRENNAN.

TRACHEA AND LUNGS

Milligan, W.: Fibropapilloma of Trachea; Removal by External Operation; Recovery. *Proc. Roy. Soc. Med.*, 1918, xi, Sect. Laryngol., 52.

The author reports the case of a female of 29 years with gradual and progressive dyspnœa which on examination proved to be due to an elongated growth on the posterior tracheal wall, apparently occupying five-sixths of its lumen. Tracheotomy and cricothyrotomy were done under local anæsthesia

and the growth removed piecemeal, its posterior attachment being cauterized with chromic acid, 40 per cent. Complete recovery followed. Microscopical sections showed a fibropapilloma.

H. H. FREILICH.

Burket, W. C.: Transplantation of the Trachea.
Bull. Johns Hopkins Hosp., 1918, xxix, 35.

With the purpose in view of the possible utilization of a tracheal transplant in human cases in which a portion of the trachea had been resected on account of malignant disease, the author undertook to study the transplantation of the trachea in dogs. As a preliminary step in this problem, it seemed to him that an important factor in the success of the tracheal transplants would be the determination of the sterility of the trachea at different levels.

A review of the literature showed the rather extensive work that had been done on the healing of tracheal wounds after resection and the use of various grafts for closing tracheal defects.

On account of the splendid results obtained in several of the cases of autotracheal transplants in dogs, it was deemed advisable to report the following experiments which seemed to divide themselves into two classes; the main division consisted in the auto- and isotransplantation of complete annular segments of the trachea in dogs; and a subordinate division which was undertaken as a preliminary step to the main problem consisted in the determination of the sterility at different levels of the trachea of the cat.

The experiment to determine the sterility of the trachea was as follows: Under ether anæsthesia and after sterilizing the operative field thoroughly with alcohol, the trachea was exposed from the larynx to its bifurcation. Blood for cultures was taken from the carotid artery. Four sets of sterile instruments were used in obtaining the different specimens, as follows: one to expose the trachea and to remove wound muscle as control culture of the operative technique; and the other sets to remove the trachea at three different levels; that is, at the bifurcation, midway up, and just below the larynx, respectively. These tracheal rings and pieces of muscle were placed in broth, in Ringer's solution, in blood, and in 1:100,000 aqueous bichloride solution. Some of the cultures were kept on ice and others at 37° C. Approximately sixty cultures were thus made. All of the control cultures and all the cultures that were kept on ice and later placed in the thermostat remained free from bacterial growth, as did also the cultures that were kept at 37° C., except for a cloudy growth after forty-eight hours in one of the broth cultures from the trachea near the hilus of the lung, which contained a small piece of a lymph gland that probably accounted for the growth. The stained smear of this culture showed a Gram-positive coccus that was not in chains. The remaining cultures of the trachea near the hilus of the lung showed no growth.

With a knowledge of the preliminary facts as stated concerning the sterility of the trachea, the following experiment in the autotransplantation of the trachea in dogs was made by Burket. The animals were kept under ether anæsthesia by mouth or through a tracheotomy wound. A midline incision was made from the larynx to the suprasternal notch and the muscles separated down to the pretracheal fascia. This fascia contained numerous blood-vessels, which in part supplied the circulation to the intercartilaginous portions of the trachea. These vessels were ligated and divided only over that portion of the trachea which was to be transplanted. A second important blood supply of the trachea was furnished by a vessel upon either side of the trachea and parallel with it; this was ligated just at the point where the trachea was to be divided, in order to preserve the circulation of the trachea to the very line of incision. After careful attention to the blood supply a segment of the trachea composed of from three to nine cartilaginous rings in length was completely separated by transverse incision and removed, thus assuring complete absence of blood supply to the transplant. This autotransplant was then replaced and sutured end-to-end by using three equidistantly placed interrupted black silk sutures, which picked up the perichondrium and cartilage without penetrating the entire tracheal wall.

All animals recovered promptly from anæsthesia and the operation. The skin wounds healed *per primam*. After operation some of the animals had a hoarse voice, a dry cough, and a rather stiff neck. When walking, they would occasionally move the neck from side to side, especially in the case of the dogs with the long transplants. Although otherwise their general condition remained very well, yet after one to three weeks they developed marked symptoms of tracheal obstruction with dyspnœa and died. Autopsy revealed a normal œsophagus and lungs, and a stricture of the trachea at the site of the transplant. Only one animal developed a purulent infection at the site of the transplant, together with a complicating bronchitis and pneumonia which caused death in four days after the operation. In these unsuccessful cases, the dogs with the short tracheal transplants lived from one to two weeks, while the animals with the long transplants lived approximately three weeks. The cases of isotracheal transplants resulted in death with symptoms similar to the unsuccessful cases of autotransplants, and autopsy showed normal lungs with stricture of the trachea at the region of the transplant.

From his experiments the author feels justified in stating that according to the studies with cultures, the trachea was practically in all cases sterile from the larynx to the hilus of the lung; that one of the transplants was an example of a perfect autotracheal transplant (54 days); that in the successful cases the healing took place by the normal layers of the tracheal wall and not by fibrous cicatrix; that there was no infiltration with calcareous salts;

that the strictures resulted from an infection which was caused by the organisms that were observed in the histological sections; that isotracheal transplants resulted in stenosis. GEORGE E. BEILBY.

McKinney, R.: A Copper Brad in the Left Inferior Bronchus. *Laryngoscope*, 1918, xxviii, 89.

The author reports the case of a child of five years who had swallowed a copper brad which was removed only after three bronchoscopic attempts. The brad, presenting its smooth surface, could not be grasped by the forceps until it was tipped over. The diameter of the bronchoscope being smaller than that of the brad, the fluoroscope was used to facilitate its removal.

The author emphasizes the point that bronchoscopic maneuvers should not be protracted, the patient being able to undergo several ten- or fifteen-minute attempts without serious injury, while a long-continued attempt at extraction, with the danger of the anæsthetic, should one be used, may cause sufficient trauma to result fatally.

H. H. FREILICH.

Hansen, P. N.: The Surgical Treatment of Bronchiectasis. *Nord. med. Ark.*, Stockholm, 1917, 1, Kirurgi, No. 13.

The author has operated upon 10 patients with brochiectasis. In 7 cases he employed pneumotomy including a more or less extensive rib resection and long drainage. Two patients died after operation, but not as a result of it. Only 1 patient recovered completely; 2 showed marked improvement. He thinks that on the whole incision is rather useless and advises its use only in cases where one large cavity exists.

The author's experience with extrapleural thoracoplasty is that it had no effect whatever on the disease or its symptoms.

In 4 cases he removed the diseased part of the lung. In some of these the other methods had failed. One patient died from pleuropneumonia in the other lung. In this case the lower lobe had been removed. Autopsy showed that there was extensive bronchiectasis in the central lobe which had not been removed. The other 3 patients made as complete a recovery as could be expected.

While thoracoplasty alone is of very little service in bronchiectasis, the author thinks it is quite rational to do more or less extensive plastic work on the chest wall, besides excising the diseased lung tissue.

Robinson of America was the first surgeon to maintain that excision of lung tissue is the only mode of bringing about recovery in bronchiectasis. The author has also obtained the best results from lung resection. W. A. BRENNAN.

Duval, P.: War Wounds of the Lung. Masson et Cie, Paris, 1917.

Duval has collected 3,453 cases of lung wounds reported by 37 different surgeons, showing a mortality of 20 per cent. The mortality falls in general with the distance from the front. Hæmorrhage and asphyxia due to mechanical interference with respiration are the two principal causes of death. In the French army all chest wounds are considered as not transportable and are held until in good condition in the first hospital that is equipped to receive them. The high mortality is due to the frequency of wounds by artillery projectiles, in which case the gaping chest wounds give double the death rate seen in the closed wounds.

Bullet wounds infrequently call for operative interference. Shell wounds, if the fragment is small and passes through, may be clean-cut, but if large, may cause ragged, deviating wounds with a large point of exit. The fragment may be retained or passed through; in either case bits of clothing or pieces of rib may be left. The latter often set up severe suppurative pleuropneumonia. The tissue about the wound may be dead, cold, and noncrepitant, and densely infiltrated with blood. It is strange that in so vascular a tissue a lung hæmorrhage is not severe unless large trunks are severed. The opposite lung may by a sort of "contre-coup" and be the seat of marked congestion or purulent pleurisy.

Severe massive hæmorrhages may be immediate or late. The immediate hæmorrhage may be imprisoned and may stop by self-compression but this adds the risk of cardiac and opposite lung embarrassment. These hæmorrhages may recur after transportation. It is in this way that late intrapleural hæmorrhages occur. Hæmorrhage and shock are difficult to differentiate. Aspiration is a valuable aid in determining bleeding, but X-ray is of value only when the patient is sitting. The blood-pressure readings, taken half-hourly, if falling indicate hæmorrhage, which demands operative interference with an attempt at direct hæmostasis. Duval has 70 per cent of recoveries in 21 desperate cases of this type.

Bullet wounds and small shell fragment wounds not complicated by bits of clothing, etc., frequently have a sterile evolution but are often complicated by pulmonary congestion or mild pleuropneumonia.

Wounds by large shell fragments, particularly if bone splinters have been carried in, are practically always followed by a grave anaerobic infection. If the lung is collapsed by a hæmothorax, it does not readily become infected but the pleura and blood bear the brunt of the activity. But if the amount of blood is small or if old adhesions prevent collapse, the lung suffers from bronchopneumonia, septic pneumonia, abscess or gangrene. True gas gangrene of the lung has not positively occurred in Duval's practice, but a wide variety of anaerobes and aerobes may be present and active.

Hæmopyopneumothorax, either free or loculated, is always grave and often fatal. The lung itself is resistant to anaerobic infection, so its wounds may be closed in order to protect the pleura.

Duval was among the first to assert that one

should treat from the very outset wounds of the lung just as he treats wounds of the soft parts elsewhere. The pathology is identical and the fear of pneumothorax is unfounded. One may eventrate the lung lobe by lobe just as one does loops of intestines, palpate, incise, resect and replace within the thorax.

Projectiles may be removed with forceps, or if almost a through-and-through penetration, the lung may be incised over it. Simple removal of projectiles does not suffice. Excision of the wound is not always possible, but in wounds near the surface it is ideal. The tract may be cleaned by stripping gauze through, which drags out foreign bodies and necrotic tissue. The pleural orifices are closed to protect the pleura.

Operation should be done as early as is compatible with the patient's general condition, but thoracotomy is not accompanied by the shock of laparotomy, and because of the rapid septic evolution of shell wounds of the lung, the operation should not be deferred too long.

Bullet wounds cause operative indications only in case of large vessel section and urgent hæmorrhage. Wounds from very small projectiles stand midway between bullet and large shell fragment wounds.

The term "open thorax" is used to describe those cases in which the offending missile has left a gaping wound in the thoracic wall. This gaping wound must be closed in order to overcome the resultant mechanical embarrassment of respiration and the resultant pleural infection. As a matter of fact, closure is to be considered as an emergency operation. Thévenot has practiced this type of closure 109 times, with a mortality of 24.7 per cent and a subsequent pleural infection in 8 per cent of the cases. The reason for this high mortality rate is that, according to Thévenot, the closure of the thoracic wound is regarded as the essential thing and the fact should be appreciated that such an operation is in reality an incomplete one. Unless the lung itself is attacked, hæmorrhage checked, foreign bodies removed and asepsis combated, one can hardly hope for other than a high mortality.

The first point of importance under operative technique is that there should be no fear of operative pulmonary collapse. Methods of combating pneumothorax at operation are rational, but they are very inconvenient to perform, and if practiced, one must make up his mind that it will be impossible to relieve injuries of the lung. If used, either the positive or negative pressure chamber keeps the lung inflated and it must be collapsed.

It is necessary to handle the lung, to inspect it, to incise it and to swing it around on its pedicle. In order to do these various things, the lung must be in a state of collapse. All of the maneuvers described above, namely, the seizing of the lung with the forceps, separation of adhesions, traction on the pedicle, if made with gentleness, have no influence on the respiration or heart action. The respiration maintains its normal rhythm, frequency, and amplitude.

The heart is not in the least excited, and Duval has never observed any reflex disturbance of cardiac rhythm. Thoracotomy with manipulation of the lung is not a shock operation. Indeed, even those cases that come to the field hospital in a state of moderate shock should not be held until the blood-pressure completely re-establishes itself, but one should rather hasten operative intervention in order to complete it before the lung enters the stage of inflammation.

The question of anæsthesia has not been definitely settled. General anæsthesia is, of course, treacherous in these cases, and local anæsthesia is in a measure inadequate, but when local anæsthesia can be used, it is the method of choice.

The chest may be opened by one of two procedures; either by making a thoracic window, or by the extensive resection of one rib. Duval has always contented himself with a simple resection of 10 cm. of one rib, followed by forcible retraction of the neighboring rib, above and below. In operations performed for the late removal of foreign bodies, the chest should be opened at the point nearest to the foreign body, but the early emergency operations call for extensive incision, so as to permit a thorough inspection of the entire lung. One should plan this incision rather with this object in view than with any preconceived notion regarding drainage of the pleural cavity. It is almost beyond question that the antero-external incision running from the axillary to the parasternal line in the neighborhood of the fifth rib gives the best exposure of the whole lung. It goes without saying, of course, that special lesions such as rib fracture call for special treatment and even demand a second incision.

The French refer to the delivery of the lung as exteriorization. When the rib has been resected, the imprisoned air of the pneumothorax rushes out in gusts. It is well to pay no attention to this and not to attempt to extract all the air but to proceed at once to treat the lung wound, leaving the removal of intrapleural air and blood for a later stage of the operation. The lung is gently seized with a light, elastic, non-crushing fenestral forceps, and by gently swinging, rotating movements, the lobe is exteriorized. It is received immediately in warm, moist compresses, and is thereupon carefully inspected on all its surfaces. After the lesion is located, the thorax opening is plugged by a thick gauze compress in order to obviate the to and fro movements of air during operation. The wound is then dealt with appropriately in accordance with the methods described, and the other lobes treated in turn, provided they have been injured.

It is necessary to operate as gently and quickly as possible and to get the opening in the chest wall closed at the earliest possible moment. In case there should be any evidence of mechanical interference with breathing, it is advisable rapidly to deliver the lung, plugging the chest wall with gauze. This

procedure is usually followed by cessation of all respiratory embarrassment.

In case the lung is bound down by adhesions, these are divided gently and bluntly, if possible; by sharp division if necessary.

In combating hæmorrhage, three methods may be used: the tamponade, suture, or ligature.

Tamponade is not to be advised except in cases where the wound is inaccessible on account of old adhesions or where the wound is large and the infiltrated lung tissue so friable as not to hold suture or ligature.

Ligature requires no explanation. It is the ideal method of hæmostasis.

Suture, however, should be explained, as it is in a large number of cases effectual even when it is used merely to close the opening of a blind wound or the openings of a through-and-through wound. According to Duval, this method seems illogical, but has worked excellently in his hands.

The presence of foreign bodies in the lung requires special mention. Radioscopic examination furnishes evidence regarding the presence of metallic foreign bodies, but unfortunately does not disclose the presence of bits of clothing or even fairly good-sized bits of fragmentary bone. The infiltrated hæmorrhagic lung does not permit one to palpate with any degree of certainty bits of clothing, moderate sized bone fragments, and often even bullets.

Metallic foreign bodies may have to be removed under some circumstances, with the aid and under the control of the radioscopic screen. The foreign body is grasped by forceps inserted in the lung wound or through a deliberately made new incision in the lung substance. The wound should always be gently cleansed with a strip of gauze in order to remove possible foreign bodies disclosed by X-ray examination, or removed by use of forceps.

After the foreign bodies have been removed and the necrotic lung tissue cleaned away by the gauze strip, or when possible after a clean excision of the wound has been made, the lung wound is sutured. Care must be taken to include the depth of the wound in the suture, and to carefully approximate the pleural edges. These sutures should not have too wide a bite. This is in order to guard against their tearing out of the lung substance during inspiration.

After the lung has been carefully attended to, the pleura and pleural cavity demand attention. The lung is replaced in the pleural cavity and gentle attempts are made with gauze sponges to mop out every vestige of intrapleural blood and blood-clot. It is, of course, impossible to remove all the intrapleural air as long as the chest is open. Since it is desirable, however, for the sake of the patient's comfort to get all this air out, Duval recommends that it be aspirated with a syringe after the chest wound has been completely closed. This closure of the chest wall must be done very carefully in order to avoid a leakage of air; the resected rib ends should be covered with muscle to get an air-tight lobe.

One must bear in mind that although the operation as described is sometimes remarkably simple, it is nevertheless exceptional for these patients to run other than a rather stormy postoperative course. Pulmonary congestion is particularly frequent, and if it occurs on the opposite side also, is almost always fatal. Pain, restlessness and groaning are practically constant postoperative occurrences. The respirations are rather shallow, the pulse small and rapid, and the expectoration bloody for the first day. It is necessary that these patients should be kept in a semi-upright posture and be judiciously morphinized. The temperature, which is elevated after operation, usually returns to normal about the fourth or fifth day, and if any air is left in the chest, it is usually entirely absorbed at the end of the fifth or sixth day. Sometimes the pleural reaction is manifested by a chill, followed by a serofibrinous or hæmorrhagic pleurisy, which is spontaneously restored.

From all of this it is evident that postoperative care constitutes a most important chapter. These patients must be made comfortable, and it is much more difficult to do this in war hospitals than it is in times of peace. They should be placed in a special ward where the temperature is constant and kept constantly above the usual normal level, where there are no currents of air. This ward should be near the operating room, or at all events connected with it by an enclosed warm passage-way. These patients should furthermore be kept well protected by warm coverings and should not be permitted to breathe dry, cold air. It is advisable immediately after operation that they be placed in an especially warmed bed.

Cumston, C. G.: Intrapulmonary Wounds from Projectiles. *N. Y. M. J.*, 1918, cvii, 362.

The pulmonary parenchyma usually has a tolerance toward the projectile embedded in it, once the inflammatory storm following the pulmonary trauma has subsided. Every penetrating wound with or without lodging of the projectile is accompanied by a focus of pneumonia associated with a hæmothorax, the so-called hæmopleuropneumonic syndrome of Piéry. Intrapulmonary retention of the projectile may be followed by the more acute sequelæ of empyema, pulmonary or mediastinal abscess, hæmoptysis due to the injury to vessels by the constant motion of the foreign body, and also by the more chronic symptoms of pain, dyspnœa, and tachycardia.

Operation for the removal of foreign bodies embedded in the lung is not so simple that it may be resorted to lightheartedly. It is a far better practice to wait until some complication sets in. Among these complications may be mentioned gas gangrene, tetanus, particularly the chronic type, pulmonary abscess about the missile, and hæmoptysis. Occasionally persistent pain may be an operative indication. It is best to delay operation whenever possible until acute symptoms have subsided.

It must be borne in mind that opening the pleura may easily transform a quiet inoffensive hæmothorax into a severe grade of empyema. Operative pneumothorax, although not devoid of danger, is not nearly so serious a factor as was formerly supposed. One of the best means of avoiding total pneumothorax is immediately to pull the lung into the thoracic incision. R. B. BETTMAN.

Beck, E. G.: Sutureless Skin-Sliding Method for the Radical Treatment of Lung Abscess and Chronic Osteomyelitis. *Surg., Gynec. & Obst.*, 1918, xxvi, 259.

The author notes the increased number of chronic suppurative infections due to war injuries, and suggests treatment based on an experience with cases originating from various infective sources. Lung tissue is particularly favorable for the growth of infective organisms, and the foreign bodies from war injuries almost invariably give rise to subsequent pyothorax.

The diagnosis of empyema and of lung abscess is discussed, special emphasis being placed on the value of the stereoroentgenogram in the diagnosis of lung abscess. The importance of low drainage in empyema is mentioned. With most careful drainage, some cases discharge for years. Four out of five cases of this class may be cured by the injection of bismuth paste. Ten per cent bismuth-vaseline paste is used, stereoroentgenograms being taken first to ascertain pathology accurately, and after injection for further study of the filled cavity. Repeated injections over several months may be necessary for therapeutic results, injections being stopped when the discharge changes from a purulent to a serous character. Cavities holding more than 200 grams or communicating with bronchi seem less likely to heal by bismuth injection.

For cases not responding to the injection of paste, the author advises the sliding skin flap operation. The technique of this operation is fully described, emphasis being laid on the importance of free exposure by rib removal. Cuts illustrate the variety of skin flaps necessary for implantation into the abscess cavity, after the latter is thoroughly cleansed with gauze and the walls scarified to promote adhesions. Gauze packing is used to press the skin flaps against the cavity walls and gauze covers the denuded surfaces. No sutures are used.

In lung abscess with open bronchus, it is advised in addition to the above procedure, that the actua cautery be used on the bronchial mucous membrane, to insure complete obliteration of the opening. To prevent fire, ether anæsthesia must be discontinued for a time and oxygen substituted to free the passages from ether.

The same principle as is used in the above cases the author suggests as being practicable in chronic suppurative osteomyelitis. Bismuth paste treatment should be given a trial first, and in more than 65 per cent of cases is effective.

Beck advises against the preparatory flushing of sinuses with watery solutions. The bismuth treatment will be ineffective unless all sequestra are first removed. These should be thoroughly defined by roentgenograms. For diagnostic purposes the injection of paste is recommended as being by far more reliable than the probe.

For cases resisting the paste treatment, the skin sliding operation is recommended, and the detailed technique is described by the author. For the areas denuded by the skin flaps, adhesive strips are used to promote epidermization. V. E. DUDMAN.

PHARYNX AND ŒSOPHAGUS

Robinson, E. F.: Stricture of the Œsophagus; Successfully Dilated from Below Upward Through a Gastrotomy Opening. *J. Missouri St. M. Ass.*, 1918, xv, 14.

The case reported by Robinson is of a girl twenty-one years of age who since birth had not retained solid food. A meal taken would be vomited four to six hours later.

X-ray examination revealed a large œsophageal pouch two inches above the diaphragm. A faint, fine shadow about the size of a small knitting needle could be traced from the pouch into the stomach. An effort was made to pass silk thread through the stricture but without success.

An operation was performed through the abdominal route. The stomach was exposed and a gastrotomy incision was made. A rubber tube was passed from the stomach into the pouch and carried into the œsophagus. A thread was then fastened to the rubber tube and carried out through the mouth. This was left in place and was used as a guide for future dilatation. M A. BERNSTEIN.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Okinezyc, J., and Daudin-Clavaud, H.: Forty Operations for Penetrating Abdominal Wounds (Quarante opérations pour plaies pénétrantes de l'abdomen). *Bull. et mém. Soc. de chir. de Par.*, 1918, xliv, 300.

Of 64 cases of abdominal wounds mostly multiple received at the authors' ambulance, 22 died in a state of shock within a few hours without operation; 2 others treated expectantly on account of the benign nature of the injuries recovered. Forty cases have been operated upon with 20 recoveries and 20 deaths. The season of the year has a particular effect which is not a mere coincidence. There is a mortality of 60 per cent in the cold season, as compared with 40 per cent in the warm season.

The authors have operated whenever the pulse was perceptible. Neither the apparent gravity of the injuries nor their extent nor multiplicity has deterred them. Fifteen of the 40 cases had a single abdominal wound; 25 had at least two and the others varied from four to twenty wounds. Multiple wounds gave a mortality of 68 per cent, as against 20 per cent for single wounds.

The authors draw particular attention to the gravity of liver wounds, even if isolated. They have seen such patients die in less than twenty-four hours without any sign of peritonitis.

The authors give particulars of 20 cases which recovered in order to show that abdominal wounds apparently of a hopeless character can recover under immediate operation. There is practically no difference in the nature and extent of the lesions between those that recover and those that succumb. A few of these cases are selected; for example: (a) 7 perforations of the small intestine, with wounds of the face, etc.; (b) 4 perforations of the small intestine; 1 perforation of the transverse colon, 1 perforation of the stomach, wounds of the left kidney; (c) 8 perforations of the small intestine, perforation of the omentum, 2 perforations of the descending colon, concomitant wounds of the neck, shoulder, thorax and arm; (d) 1 perforation of the colon; a tear of the mesocolon, 2 perforations of the small intestine; 1 kidney wound. The average time elapsed between injury and operation was seven and one-half hours.

The first attention given to these wounded is warmth. They are kept in a temperature varying from 45 to 50 degrees. Injections of camphorated oil, adrenalin and morphine are made half an hour before operation. Ether or chloroform is used as an anæsthetic. A supra- and subumbilical incision is used to enable the whole abdomen to be explored. On opening the abdomen, lesions of the small intestines are most constantly recognizable by their dilatation and paralytic atony. Such intestinal loops are isolated and exteriorized protected in compresses. A general exploration is made before treatment in detail is begun. After resection end-to-end anastomosis is preferred to the lateral. It saves time and the results are more satisfactory. Silk is used for suturing.

The authors have entirely discontinued lavage of the peritoneum with ether owing to the abrupt fall in pressure. Warm salt solution is used. Drainage is suppressed as it has been found useless or even hurtful, but occasionally the Douglas pouch is drained for from twenty-four to forty-eight hours. As far as the conditions permit, concomitant wounds, removal of projectiles, etc., are attended to at the primary operation. W. A. BRENNAN.

Cosens, W. B.: Reflex Phenomena Produced by Commencing Abdominal Hernia. *Practitioner*, Lond., 1918, c, 155.

After examining over 20,000 English and German soldiers, it is the author's opinion that bubonocele is the first stage in the development of a hernia, the presence of a hernia indicating the failure of the surgeon to recognize the early phenomena which are reflex and consist of uneasiness in the epigastrium, but not actual pain, discomfort of a dragging character referred to one or the other costal margin or its immediate neighborhood, pain in the back corresponding to the ninth and tenth ribs, nausea but no vomiting, and often constipation. Seldom is there any discomfort below the umbilicus. Sometimes the skin is more sensitive on one side of the abdomen and occasionally there is slight tension over the upper segment of the rectus. When the patient stands with feet together and head up, if equal pressure over both inguinal rings is applied, he complains of tenderness on the side on which the above symptoms are present. The treatment consists of a lightly applied truss or radical operation.

H. H. FREILICH.

Payne, M. J.: An Improved Technique for the Repair of Inguinal Hernia. *South. M. J.*, 1918, xi, 243.

In employing an improved technique for the repair of inguinal hernia, the author adopts in the main the essential principles of the original Bassini operation.

1. In the modification proposed the cord is laid on top of the line of sutures in the deep layer of Poupart's ligament, and the inferior aponeurotic flap is then united to the muscular flap of the internal oblique and transversalis muscles, to the external margin of the rectus and conjoined tendon (preferably by interrupted sutures), observing special care in placing the suture to make some tension on the inferior aponeurotic flap, in order that a relaxation of the tension on the deep suture line may be obtained.

2. The superior aponeurotic flap is now united to the anterior surface of the inferior aponeurotic flap, giving a wide area of approximation.

3. The fascia, fat and skin are united.

It is believed that the improved technique in principle and effect accomplishes the following:

1. It permits a relaxation of tension on the line of sutures, apposing the muscular structures to Poupart's ligament. The principle is that of a "guy rope."

2. It allows a wider and easier approximation of tissue.

3. It implants an additional layer of tissue in front of the deep ring.

4. It furnishes a more convenient source of obtaining fascial support than flaps taken from the rectus sheath.

5. The relaxation of tension on the structures is more easily and more certainly accomplished.

6. It lessens pressure upon the spermatic cord, a frequent cause of discomfort after operations for hernia.

7. The relaxation of the tension on the deep suture line allows the regeneration of tissue to be more

certain and therefore the union between the parts is more capable of resisting the effects of immediate and remote strain.

8. The special feature of the modification suggested is a reinforcement of the wound, by uniting the lower aponeurotic flap to the deep or muscular structures.

In addition to this special feature, the various structures brought into apposition are more readily overlapped, at the same time relaxation of tension on the most important suture line is easily accomplished. E. C. ROBITSHEK.

GASTRO-INTESTINAL TRACT

Balfour, D. C.: Cautery Excision of a Gastric Ulcer; Further Observations on the Value of the Method. *Tr. Am. Surg. Ass.*, Cincinnati, 1918, June.

The author bases his observations on 214 cases of gastric ulcer in which the cautery has been employed in the Mayo Clinic, showing the advantages of cautery excision and briefly comparing its results with those of other standard methods, particularly knife excision.

The first group of cases in which the cautery was applied comprised the lesser curvature ulcers in such high situations or so extensively indurated as to make knife excision an operation of difficult technique or poor surgical judgment. Under the circumstances, although gastro-enterostomy alone could be counted on to relieve the symptoms in a certain percentage of persons with such ulcers, the advantage of being able, without additional risk, to destroy the crater of the ulcer, and to sterilize the infected area by means of the cautery, was perfectly obvious. The results in this group of cases were very satisfactory and the employment of the cautery was carefully extended so that at the present time, in a large percentage of gastric ulcers, the method appears to be the one of choice.

There are certain limitations in the method which should first be noted; chiefly, that it is not applicable to those ulcers which have definitely undergone malignant change unless the lesion is irremovable because of its size, situation or fixation, and that the procedure should be carried out only after the stomach has been sufficiently mobilized to enable safe exposure.

The value of the cautery in gastric ulcer seems to depend largely on two factors, namely, heat and perforation. The efficiency of heat as a sterilizing agent in infected fields is well known, and since Rosenow has demonstrated the elective localization of streptococci in gastric ulcer, the application of heat in such an infectious process is clearly indicated.

Complete perforation by the cautery point through the center of the crater of the ulcer has been made an essential in the technique because of the clinical fact that spontaneous and complete perforation of a gastric ulcer is, presupposing recovery from this accident, quite likely to be followed not only by the cure of the ulcer, but by the cure of the patient. The frequency with which nature attempts perforation is shown by the fact that in a very high percentage of ulcers a protected perforation has occurred by the time they come to the operation. The cautery technique will almost always reveal a minute but very definite point in the thickened gastric wall which marks the site from which the leakage has occurred, indicating the center of the crater of the ulcer and serving as an excellent guide for the introduction of the cautery point. Cautery puncture, combining as it does the beneficial action of heat with an artificial perforation, possesses a double efficiency and it is undoubtedly to these two factors that the success of the method is largely due.

The most important advantage of cautery excision concerns its application in ulcers of the lesser curvature.

Clinical experience bears out the observations of Barber and Stewart that excision of a segment of lesser curvature does definitely impair gastric motility, for it is now well known that excision alone of a lesser curvature gastric ulcer frequently fails to completely relieve symptoms, and in order to obtain the best possible results, such an excision must always be combined with gastro-enterostomy. Cautery excision, on the other hand, reduces to a minimum interference with the future motility of the stomach. Carman, in roentgenologic studies of the stomach following different types of operation, has recently demonstrated that cautery excision and gastro-enterostomy give much better motility and function and results in much less deformity than does knife excision and gastro-enterostomy. This fact can hardly be over-emphasized.

The author believes that any inefficiency of the cautery, in cases in which early and unrecognizable malignant change has taken place, is more apparent than real. It has been found in the 1,004 patients operated upon in the clinic for gastric ulcer that in those individuals dying months or years later from what was known to be gastric cancer, the operative reports almost invariably stated that malignancy was strongly suspected, the lesion was not safely removable, and a gastro-enterostomy only had been done. The practice is also made in the clinic of shaving off a portion of the ulcer base or rimming out the crater for microscopic examination before using the cautery, with immediate resection, if the ulcer is malignant and operable. The fact, too, that the cautery can be used in a large group of cases in which excision is impracticable more than offsets any disadvantages of the method when used in excisable cases. The destructive action of heat on the cancer cell is so positive that it is not unreasonable to hope that in some of these large irremovable ulcers which have already taken on early malignant change in the ulcer base, the thorough cauterizing of the base may destroy these cancer cells and prevent an otherwise certain death from cancer later.

Sufficient experimental evidence was originally obtained to show that no marked difference in rapidity of repair was noted in the line of closure following cautery excision and knife excision.

The author cites one case in which an opportunity was obtained some months after cautery excision of a large and indurated gastric ulcer to observe the condition of the stomach. There was practically no evidence that a lesion had ever been present, and the induration had entirely disappeared.

The operative mortality of cautery excision and gastro-enterostomy has been, in the series of 186 cases, 1.1 per cent. In the 2 deaths, the operative field was in perfect condition. Knife excision and gastro-enterostomy in the series of 89 cases showed a mortality of 3.3 per cent.

The convalescence of the patients in whom cautery excision and gastro-enterostomy are done is uniformly smooth, and the clinical postoperative course bears out Carman's observation that better gastric motility is attained than in those operations which entail greater damage to the musculature of the stomach. The reports of the late results, as they come in, are most favorable. Of the 61 cases in which the cautery was used in 1914 and 1915, there is positive information in 55. In this number there have been 4 deaths from all causes since operation, 2 already mentioned following operation, the other 2 of unknown causes at their homes in the three or four years after leaving the clinic. Of the remaining 51 cases operated upon in the two years, 80 per cent of the patients report a satisfactory result, 18 per cent were improved in the sense of amelioration of symptoms present previous to operation, while in no instance did a patient report that he had not obtained relief from the operation. The cases of knife excision and gastro-enterostomy in this period show corresponding figures of 70 per cent and 15 per cent, while 15 per cent of the patients state they are no better. These figures of mortality and late results have more force when it is remembered that knife excision cases are essentially selected, inasmuch as this operation is done only when conditions are favorable, while the cautery is often employed in the very case in which excision is unwarranted because of the size, fixity, and situation of the ulcer.

The experience in the clinic with the cautery has shown that this wide excision is just as unnecessary as it is in the treatment of infectious foci elsewhere, and that the indurated area can be restored to a healthy condition by destruction of the crater, and thorough heat sterilization of the surrounding tissues, as the cautery is held in the punctured crater so that knife excision under such circumstances, necessitating as it does complete removal of the indurated area, is an unsatisfactory procedure if some substitute is available which will accomplish as much without unnecessary sacrifice of gastric wall.

The apparent advantages of the method may be summarized as follows:

1. The cautery efficiently destroys the focus of infection in gastric ulcer without the sacrifice of nature's protective induration surrounding the ulcer crater.
2. It may be applied in a large percentage of gastric ulcers.
3. It entails a minimum of operative risk.
4. Clinical and roentgenologic evidence shows better motility and function than follow knife excision and gastro-enterostomy.
5. It has a particular efficiency in obviating early and late postoperative hæmorrhage.
6. The late results are better than those obtained by any other method.
7. It can be used in cases in which no other means of direct attack on the ulcer is justifiable.
8. It is probable that in gastric ulcer, cautery, like knife excision, should always be combined with gastro-enterostomy.

De Buys, L. R., and Henriques, A.: Effect of Body Posture on the Position and Emptying Time of the Stomach. *Am. J. Dis. Child.*, 1918, xv, 190.

The effect of body posture on the motility of the infant's stomach was studied. No matter what the position of the stomach, the gas bubble always rose to the highest point of the stomach. In twelve cases examined in the prone, supine, erect, lateral, right and left positions, it was observed that the stomach emptied itself in from two to three hours.

In these observations the child was given its customary food with barium sulphate, the amount varying from 100 grains in a six-weeks-old child to one ounce in a five-year-old child. The barium was thoroughly mixed with the food. In no instance were any untoward effects noted. The Coolidge tube was used and screen tracings made.

The results obtained were as follows:

In a comparison of right and left lateral positions, the right showed increased motility. In a comparison of the right lateral with the supine, prone and erect positions, the motility was greatest in the right lateral position.

Comparison of other positions was interfered with by colic, but motility in the majority of the remaining experiments seemed to indicate greater motility in the left lateral position than in the supine.

I. E. Bishkow.

Barber, W. H.: Gastro-Enterostomy; the Stoma and Efferent Loop. *Interst. M. J.*, 1918, xxv, 84.

In some cases only an "interval" or temporary functioning of the gastro-enterostomy opening is all that is required. In these cases the author states that almost any opening between the stomach and jejunum will suffice. But when the obstruction at the pylorus is permanent, a properly placed stoma joined to an isoperistaltic loop of proximal jejunum will afford the greatest degree of postoperative comfort.

By experiments on dogs it is shown that the mid-fundic, transverse stoma interferes most and a

pyloric vertical least with the peristaltic wave and that while the gastric contents may gravitate from the midfundic opening, it is propelled from the vertical pyloric opening. The direction of the dejecta from a pyloric opening is in the direction of the stomach's drive, from left to right. It thus seems reasonable that an attachment of the jejunum downward and to the right which throws the gastric-emptying peristalsis in line with jejunal-continuing peristalsis will give the best results.

The following recommendations are made:

1. For normal or hypertrophied stomachs, the nearer the artificial stoma coincides with the physiologic point of outlet, the greater is the efficiency of the stoma. The stoma should be a perpendicular one.

2. For stomachs dilated beyond apparent hope of regeneration, the transverse midfundic stoma seems most efficient.

3. For moderately dilated stomachs in which an appreciable return of original tonus may be expected, a perpendicular antral stoma seems most efficient.

4. Whenever possible, the jejunum should be so chosen that the portion to be anastomosed falls naturally along the line of the proposed gastric opening. Excepting in atonic stomachs, in most instances the course of the efferent loop will be downward or downward and to the right.

The technique of gastro-enterostomy is as follows: The gastric stoma is made in the pyloric antrum in line with the vertical portion of the lesser curvature. The jejunal loop, as short as feasible, is attached with the efferent portion downward or downward and to the right. S. A. CHALFANT.

Smithies, F.: Gastric Function Following Gastro-Enterostomy; an Analysis of 273 Cases. *Surg., Gynec. & Obst.*, 1918, xxvi, 275.

Of 8,826 individuals with digestive disorders, Smithies had 273 undergo operation for gastro-enterostomy. This group represents 11.6 per cent of 2,360 cases upon whom operation had been done for diseases of the stomach and duodenum.

These cases were gastric ulcer, 571; duodenal ulcer, 1,469; gastric cancer, 320. Of the 273 cases composing this series, 170 were male and 103 female. The average age at which gastro-enterostomy was done was 44.3 years for males and 41.5 years for females. These cases returned for postoperative examination from a few weeks to nine years after operation.

In 95.4 per cent of cases the operative procedure was posterior gastro-enterostomy with or without pyloric closure or local or extensive gastric resection, and combined with removal of the appendix or with drainage or removal of the gall-bladder. In 4.24 per cent a posterior gastro-enterostomy was employed and in one case due to faulty anatomic orientation a gastro-ileostomy was done under the impression that a gastro-enterostomy had been done. This patient lived nearly a year.

In those cases seen shortly after operation one would not expect total restoration of gastric function; 20.9 per cent were free from complaint; 49.8 per cent were clinically comfortable, and in 87.89 per cent subjective benefit had resulted.

There are a series of tables classifying the results of the operations, grouped under the following headings: clinical condition of patients; post-operative symptoms in patients not dyspepsia-free; objective evidence of digestive malfunction; test-meal observations; observations upon gastric acidity; other chemical test-meal observations.

I. E. BISHKOW.

Lewisohn, R.: Clinical and Experimental Studies on Congenital Pyloric Stenosis. *Surg., Gynec. & Obst.*, 1918, xxvi, 318.

Congenital pyloric stenosis is due to a malformation of the pylorus with secondary œdema. The clinical symptoms are incessant vomiting, loss of weight, constipation, palpable tumor and visible peristalsis. The presence of a pyloric tumor is pathognomonic, but in the absence of this, the other symptoms are sufficient to warrant the diagnosis. If proper diet, paregoric and other medical remedies fail, operation is indicated, though the mortality is high.

Until a few years ago, gastro-enterostomy was the only operation done, but in 1913 Rammstedt's operation became popular because of its apparent simplicity, although it is quite dangerous. This operation consists in making a longitudinal incision through the thickened and hardened pylorus, through all layers down to but not through the mucosa. If the incision fails to divide all fibers, it does not relieve; if it extends a trifle too far on the duodenal side, perforation of the thin duodenal wall with resultant disastrous consequences is almost inevitable.

Lewisohn performed a series of operations on dogs to demonstrate the histologic result of the Rammstedt operation. The following conclusions were drawn:

Following an incision of the pylorus through serosa and muscularis, there is evidently a gaping wound produced, which fills with blood-clot, to which the omentum becomes adherent. This clot is replaced by fibrous tissue, which, when it contracts, brings the cut muscle ends into such close apposition that they may only be separated by millimeters. Regeneration of the smooth muscles does not seem to occur. LISTER TUHOLSKE.

Andrews, E. W., and Mix, C. L.: A Case of Duodenal Ulcer; Its Diagnosis and Treatment. *Surg. Clin. Chicago*, 1918, ii, 1.

Andrews and Mix report a case of duodenal ulcer, the latter covering the diagnostic phases of the case and the former reporting the technique of the operation and the operative findings.

The patient was a young man of twenty-three, with a negative past and family history. He com-

plained of a heavy distress in the epigastrium, made worse by the ingestion of food and relieved only by bicarbonate of soda and oxide of magnesia. He also complained of some nausea without vomiting, and eructations of sour and acrid stomach contents. He had lost about 20 pounds in weight in two years. This trouble had been present about three and a half years, during which time he was on medical treatment, with no permanent relief.

Examination of the stomach contents showed a total acidity of 53, free hydrochloric acid of 37, but no blood. Blood was found in the fæces after a meat-free diet. Urine and blood examinations were negative.

Fluoroscopic examination showed barium and buttermilk passing freely down the œsophagus into the stomach. In the stomach the barium sank to a very low level, almost to the left iliac fossa because of the great elongation and downward displacement, which was of the fishhook type. The pylorus was rather fixed when manipulated by pressure on the abdomen. Examination of the movements of the stomach showed an exaggerated hypermotility.

X-ray plates were then taken immediately and at intervals of fifteen minutes and five hours. The first plate showed a very much elongated stomach with a large gas-bubble at the top. The pyloric area was somewhat contracted. There was no distinct duodenal cap, though the plate clearly showed the bismuth passing into the duodenum. The second plate showed a very marked contraction in the region of the pylorus. The third plate showed a marked five-hour retention.

Mix considered the history clearly indicative of a stomach ulcer, but believed that the X-ray plate, with its absence of duodenal cap and apparent localization of a patch of bismuth in the duodenum, was strongly suggestive of a duodenal ulcer.

In presenting the case he discusses each symptom and explains its relation to the diagnosis. He brings out a point in regard to the presence of gas in the stomach which is of interest to the layman as well as to the physician. He says the symptoms of gas and belching are common to all abdominal diseases associated with hyperacidity, and that in all of these conditions the effect of the hyperacidity upon the patient is to induce that patient to believe that there is gas in the stomach. In order to get rid of the fictitious gas, which is really nothing but the sensation caused by excessive acid, the patient makes numerous endeavors to belch, and in the course of time may swallow sufficient air to make it possible to get a little back. It is positively known that these belchers do not have great masses of gas in the stomach and that in every instance where they are given barium and buttermilk and a fluoroscopic examination made, there is found only a small bubble of gas in the fundus of the stomach, the so-called "Magenblase."

He calls attention to the fact that the patient complained of intense constipation for three and a half years, which raises the presumption of the presence of gastric or duodenal ulcer as against the presence of biliary tract infection.

Another important point is the possibility of the presence of both gastric and duodenal ulcer in the same patient. When the ulcer of the duodenum develops first, the sympatomatology consists chiefly of pain to the right of the epigastrium associated with tenderness in the duodenal area. The pain comes on one to two hours after meals and is relieved by the taking of food. When in the presence of such an ulcer of the duodenum a gastric ulcer develops, the symptomatology of the gastric ulcer immediately comes to the front and completely disguises the symptomatology of the duodenal ulcer. The pain of the gastric ulcer comes on immediately after meals and runs over, merges into, and becomes continuous with the pain of the duodenal ulcer, coming on one to two hours after meals.

On the other hand, if the gastric ulcer is first to develop and the duodenal ulcer develops subsequently, there is no means of making a double diagnosis. In such a case the only possible way of discovering the presence of a duodenal ulcer is by the X-ray examination of the duodenal cap.

He says that this double diagnosis of gastric and duodenal ulcer must always be borne in mind in any given case, because the association is a common occurrence. When the gastric ulcer is added to duodenal ulcer, the diagnosis is easily made. On the contrary, when duodenal ulcer is added to gastric ulcer, no suspicion of it will enter the examiner's mind except such suspicion as may be aroused by the fluoroscopic examination or the roentgenograms.

As to the method of treatment, Mix recommends operation. Medical treatment has been of no avail. A gastrojejunostomy will give the ulcer a chance to heal while food is passing the new way from the stomach into the jejunum.

Andrews in performing the operation follows the usual technique for stomach cases. Examination revealed a hard, scirrhous cicatrix 4 cm. below the pyloric ring. It was 1 by 1½ cm. in size and not at the pylorus, so that the symptoms of obstruction must have been due to reflex spasm of the pyloric sphincter brought about by the irritation of that ulcer floor when the acid gastric juice flowed over it. The gall-bladder and pancreas were negative. Andrews says it is the type of ulcer of the first portion of the duodenum which is often hopeless without surgery. He made a posterior gastrojejunostomy with a no-loop, occluding the pylorus by simple ligation. He calls attention to the various methods of occluding the pylorus.

He says that a certain amount of the sudden relief obtained from gastro-enterostomy is due partly to the regurgitation of bile and pancreatic fluid, as shown by Patterson. The result of that improvement is that the duodenum or even the stomach wall is relieved of irritation and the ulcer heals slowly. The ulcer heals and the stoma functionates for a while, but eventually the pylorus opens up again and then the stoma decreases much in size or may

even close entirely. Why this occurs is difficult to say. When the pylorus is occluded, however, the artificial stoma does not close and the ulcer area is permanently protected from the old irritation.

G. W. HOCHREIN.

Palmer, D. W.: Duodenal Fistulæ. *J. Am. M. Ass.*, 1918, lxx, 595.

The author comments on the scarcity of literature on this subject, and believes that duodenal fistula occurs much more frequently than references in literature would indicate. Several authors are quoted, each giving a very gloomy prognosis, especially in cases treated expectantly.

Duodenal fistulæ constitute a distinct class because of: (a) marked rapid inanition; (b) very rapid dehydration; (c) subsequent specific toxic action; (d) digestion of tissue by secretions; (e) varied nature of secretions, making them hard to control; (f) liability of marked hæmorrhage on account of digestion; (g) occurrence of fat necrosis; (h) possibility of peritonitis due to digestion of adhesions; (i) the amount of discharge, which is out of all proportion to the size of the opening.

The treatment may be either direct or indirect, surgical or expectant. The author's cases were both treated expectantly, so that surgical treatment is not discussed. The objects of treatment are: (a) protection of the skin and tract from digestion; (b) maintenance of nutrition and sufficient fluids; (c) limitation, neutralization, and dilution of secretions.

Low melting paraffin is a good skin protector if the surface can be dried sufficiently so that it will adhere; if not, zinc oxide lanolin is to be used. A solution of pure gum rubber in benzine also makes a good protection.

For the tract the injection of liquid paraffin or zinc oxide lanolin helps and petrolatum by mouth protects the tract from within. Nutrition is best maintained by rectal injections of glucose and soda with tincture of opium as a sedative.

Foods should be those exciting as little secretive action as possible, such as milk, oils, etc. Atropin and epinephrin tend to limit secretion, and the gastric acidity should be controlled by alkalies.

Irrigation of the tract by weak alkaline drip is beneficial if the overflow does not add to the skin digestion.

The author's first case followed eight days after resection of the stomach for cancer. Skin digestion was rapid. Food was cut off; atropin and sodium fluoride were given by mouth, and 2 per cent sodium fluoride was used as a wet dressing and injected along the tract. Paraffin was used as a skin protection. The discharge of bile and pancreatic fluid ceased after eight days, and the wound healed six days later.

The second case followed six days after a difficult operation for removal of stone in the ampulla of Vater. Foods were stopped by mouth, and glucose and soda bicarbonate rectal feedings were given. Large doses of soda bicarbonate and atropin were given by mouth, sodium fluoride, one grain, by mouth, and irrigation with 1 per cent sodium fluoride showed no results after four days. Paraffin was only partially successful as a protective. On the twelfth day continuous drip irrigation was begun and continued until excoriation of the back caused its discontinuance. On the eighteenth day belladonna and epinephrin were given every two hours by mouth, the glucose solution continued, and the tract was plugged to its depth with sterile 5 per cent zinc oxide. Large doses of petrolatum were given, and on the twenty-eighth day the fistula had closed.

H. J. VAN DEN BERG.

Sluss, J. W.: Tuberculosis of the Cæcum. *J. Indiana St. M. Ass.*, 1918, xi, 99.

The author characterizes the stages of tuberculosis of the cæcum as: (1) the ulcerative stage; (2) hyperplasia; (3) cicatrization.

Two cases are cited which represent clinically two distinct stages of tubercular disease of the cæcum. Diagnosis of either tuberculosis or carcinoma was made on a Bulgarian, aged thirty, with symptoms of appendicitis. Operation revealed a knobby tumor studded with tubercles, involving the cæcum, ileum and colon just beyond the tumor mass. The appendix was practically normal. The tumor mass was lifted out of its bed by an incision in the parietal peritoneum along the outer border of the cæcum and ascending colon. The ileocolic and colica dextra arteries were ligated close to their origin; the ileum was sectioned well beyond the lesion, its stump inverted; and the mesentery containing the lymphatic glands was removed by a V-shaped section. The denuded area was covered over with the great omentum and the opening closed with drainage leading down to the emptied space. Pulmonary tuberculosis lighted up later, causing the patient's death.

Operation on a young woman of a tubercular family revealed an enlarged appendix, and a thickened, tubercular studded cæcum. The patient recovered from the operation but pulmonary tuberculosis with added abdominal symptoms caused death later. Ileocæcal tuberculosis in the great majority of cases is primary as far as can be determined.

The affection occasionally may begin in the mesenteric glands and may follow the lymph-channels inversely to the cæcum, fasten to its peritoneal coat and eventually reach the mucosa. The ileocæcal mucosa is a region of least resistance to bacteria because of the presence of Peyer's patches, of diminished peristalsis, and a degree of stasis, and changes in the reaction of the intestinal content. Bacterial activities easily produce ulceration areas which become the site of great proliferation of tissue in the later processes of disease. These areas gradually become organized so that marked hyperplasia supervenes. In the terminal stage inflammatory tissue tends to contract

and distort. Thus in the ulcerative stage, pain and febrile attacks may be expected. In the hyperplastic stage, the symptoms are irregular disturbances of intestinal function, and in the final stage, intestinal obstruction may mask the other clinical features.

From the ages of twenty to forty is the period when ileocæcal tuberculosis is most apt to occur. The sexes are affected about equally. A certain class of foreign laborers are most susceptible because of the kind of food eaten.

Ileocæcal tuberculosis may be diagnosed as acute appendicitis or tuberculous peritonitis in its earlier stages; later, as appendicitis with inflammatory exudates or abscess formation; and in its terminal stage as carcinoma. Many cases are wrongly diagnosed or overlooked. Chronic appendicitis, tubercular peritoneal adhesions, pelvic disease, ileocæcal tuberculosis and actinomycosis have similar symptoms at certain stages. Carcinoma rarely occurs before the age of forty. The duration is eight to nine months, while the tubercular condition is two to three years.

The pathology is ulceration of the mucosa, hyperplasia of all layers and especially the peritoneal covering; terminal cicatrization with stenosis. The tumor mass is not usually adherent. Treatment is excision if undertaken before metastasis and obstruction intervene. Before a tumor has formed, treatment applicable to pulmonary tuberculosis, with the addition of special attention to intestinal antisepsis, is wholly rational. Opening the abdomen in peritoneal tuberculosis is often sufficient to effect a cure. F. P. HAMMOND.

Wessel, C.: Remarks on Appendicitis. *Nord. med. Ark.*, Stockholm, 1918, 1, Kirurgi, No. 19.

Wessel reports on 300 cases of appendectomy in the Bispebjaerg Hospital, Copenhagen, during the last few years. Of these patients 274 have been discharged, and 26 have died, a mortality of 8.66 per cent. Operation was undertaken in the first stage in 242 cases; 214 were operated upon in the acute stage and in these the mortality was 11.2 per cent.

With regard to the pathogenesis of appendicitis, Wessel says that while it must be considered absolutely improbable that the cæcal contents under normal circumstances can fill the appendix, yet when the cæcum is subject to hyperperistalsis from any cause, intrusion of its contents, including bacteria, into the appendix is possible and probable. Such a state of cæcal hyperperistalsis may occur in obstipation due to intestinal toxines, etc. Appendicitis is of enterogenous origin. Inflammation of the appendix can be caused by bacteria as well as by toxic albumins or by both together.

The treatment of peritonitis is still a mooted question. The author's hospital experience has shown him that a sterile peritonitis is likely to be found during the first twelve hours, however extensive the peritonitis may be and notwithstanding its serous or suppurative character. In his hospital he undertakes primary suture in all cases where there is no peritonitis or where this is only serous or very slightly suppurative. W. A. BRENNAN.

Verbrycke, J. R., Jr.: Two Cases of Phlegmonous Colitis. *Wash. M. Ann.*, 1918, xvii, 122.

The first case was a girl seventeen years of age who had had typhoid fever when four years old. She was constipated and six months previously had rectal dilatation, at which time the rectum was pinched in the blades of the speculum. Immediately afterward, she began passing blood, which condition gradually grew worse; she passed bloody mucus and had six to fourteen loose movements daily. Later each movement was followed by pain in the stomach and vomiting. She was anæmic but well built.

The urine showed a trace of albumin and several hyaline casts. The stomach contents were practically normal. Leucocytes were 23,000 to 30,000. Temperature 99 to 102 degrees. Proctoscopic examination showed intense congestion with ulceration and offensive sloughing material. The latter gave a pure culture of staphylococci.

With local treatment and autogenous vaccine for ten days, the bloody and mucous stool stopped, but the vomiting and general condition gradually grew worse. There developed abdominal tenderness and rigidity. Radiographs showed a thickened colonic wall throughout. An appendicostomy was performed and the colonic wall noted to be half an inch thick, with a phlegmonous hardness and blood-red congestion of the peritoneal coats. Examination of pus discharged each day showed a pure culture of colon bacilli and proteus. The patient died the fourth day after operation from paralytic ileus.

The second patient was a woman seventy years of age, who had always had trouble with the bowels and had had several milder attacks similar to the present one. She ran a low typhoid-like temperature. The Widal test was negative and the leucocyte count 20,000. Vomiting had occurred several times and she had six to eight bowel movements daily.

Examination was negative except for a general abdominal rigidity; the tenderness was slight and general. Proctoscopic examination showed intense congestion of the mucosa without ulceration. Radiograms showed spasticity of the cæcum. No operation was performed. The case ran a protracted course of several months with final recovery. The author thinks this case was identical with the first case. CARL R. STEINKE.

Bevan, A. D.: Benign Stricture of the Rectum; Treatment by Dilatation Under Anæsthesia and Transplantation of Mucous Membrane. *Surg. Clin. Chicago*, 1918, ii, 67.

The patient's chief complaint was symptoms of intestinal toxæmia because of failure to have regular and complete bowel movements. Examination before operation showed the stricture to be only two inches in length.

The plan of treatment was to dilate the rectum very fully and widely and then free the mucous membrane of the dilated rectum above the point of stricture for an inch or more, bringing it down and uniting it to the margin of the anus. It is not necessary to remove the black linen sutures which are used, as they will come away themselves in eight or ten days. He suggests passing a rectal speculum gently into the anus and dilating it moderately every two or three days during the closing days of wound healing.

He reports an admirable result in his case. He adds that these rectal cases should not be lost sight of, but should be kept under careful observation for a considerable period and moderate gentle dilatation with the speculum carried out to insure against subsequent stricture. G. W. HOCHREIN.

Bodkin, M. L.: The Varieties of Stricture of the Rectum. *Am. J. Surg.*, 1918, xxxii, 62.

Stricture is most frequently found in the rectum, as compared with other outlets of the body. Causes for rectal stricture are classified as follows:

Malignant disease, congenital defects, traumatisms (operations), venereal disease, catarrhal inflammations, tuberculosis, ulcerations, spasm of the sphincters, hypertrophy of Houston's valves, pressure from adjacent organs or tumors, and acute inflammations.

Constipation, obstipation and fæcal impaction with or without blood or mucus in the stools are the chief symptoms. The point where the levator ani muscle encircles the rectum and within 3½ inches from the anus are the most frequent sites.

Cancerous stricture which has not undergone apparent ulceration is a firm, inelastic, epithelial growth; inflammatory stricture supplies a history of disease in or about the rectum before the formation of stricture and may be accompanied by constitutional disturbances. Sarcoma assumes the rounded ball-like shape usually and is formed from the underlying connective tissue stroma; syphilitic stricture is a proliferating process without band-like characteristics of the cancer; and tuberculous stricture does not constrict the rectum because it breaks down almost as rapidly as it is formed. Ulceration of the rectum due to kidney, heart, lung, and venereal diseases, as well as simple catarrhal or specific inflammations, may cause stricture. Acute suppurative inflammations of the uterus or its adnexa, severe cellulitis or peritonitis in this region may cause the condition.

Operative procedures where surgeons remove too much redundant tissue cause stricture of the anal opening when the subsequent contractions occur after operation. F. P. HAMMOND.

Hanes, G. S.: Inflammatory Rectosigmoidal Strictures Hitherto Undescribed. *Interst. M. J.*, 1918, xxv, 39.

The type of stricture observed by the author in eight cases is characterized by the following points:

1. It always involves the rectosigmoidal juncture.
2. Very soft and friable wart-like eminences or excrescences grow out from the surfaces of the strictures. They vary from one-fourth to one-half of an inch in length, are found along the entire length of the stricture, and rarely tend to pedunculation.
3. They have an extraordinary tendency to bleed when subjected to any kind of manipulation.
4. There is a characteristic grayish-white deposit, resembling diphtheritic membrane, all along the strictured surface.
5. The patients have an annoying diarrhœa.
6. The strictured portion may involve four or five inches of the gut or it may extend up into the sigmoid eight to ten inches.
7. The thickened condition of the wall of the gut is quite uniform and is due to the increase of the connective tissue elements and also a thickening of submucous and intermuscular coats. The author feels convinced that a definite type of germ life is responsible for the pathology.
8. The local symptoms are constriction of the lumen of the bowel, numerous wart-like growths, accumulation of a moderate amount of mucus, leucocytes, bacteria, epithelial cells, etc., with but little microscopic blood. There is an annoying sensation in the rectum which causes a constant desire to strain. Large hæmorrhoids are not infrequent complications. From the constant diarrhœa present, pain, loss of sleep, interference with digestion, etc., the patients become thin, nervous, anæmic, emaciated, and die from exhaustion.

Colostomies have been done in 3 of the 8 cases, while in the remaining cases the small tumors were destroyed by fulguration. E. B. FREILICH.

LIVER, PANCREAS, AND SPLEEN

Amster, J. L.: Wandering Dropsical Gall-Bladder. *N. Y. M. J.*, 1918, cvii, 244.

Amster states that a review of the literature tends to convince him that wandering dropsical gall-bladder is not of exceptionally rare occurrence. The diagnosis, however, may be very difficult, as the condition may be mistaken for floating kidney, ovarian cyst, etc.

Hydrops of the gall-bladder may be due to obstruction from within or without the cystic duct. Chronic inflammation of the gall-bladder and its ducts most often causes occlusion of the cystic duct with permanent hydrops. A stone or many stones impacted in the cystic duct may produce the same condition. A dropsical gall-bladder may become more and more distended until it occupies almost the entire abdominal cavity.

The author reports the case of a woman aged fifty, from whom he removed a very large dropsical gall-bladder, measuring 6 by 9 inches in circumference and weighing 10 ounces, by the evisceration method of Tilton. In this case there was a very large stone impacted in the neck of the gall-bladder,

evidently the cause of the tremendous distention. There were also several smaller stones in the common duct. This patient had had symptoms referable to the gall-bladder for years, the most constant one of which was jaundice, which inevitably cleared up following each attack of colic.

The diagnosis in this case was based upon the following:

1. History of repeated attacks of biliary colic.
2. A tumor in the gall-bladder region which could not be far displaced from its original position.
3. Movement of the tumor with inspiration and expiration.
4. The globular and fluctuating character of the tumor.
5. Tenderness to pressure over the tumor mass.
6. The distinct separation of the tumor mass from the palpable loose kidney and lack of connection with any of the pelvic organs.

HARVEY B. MATTHEWS.

Legueu, F.: Anaerobic Bladder Gangrene (Les gangrènes vésicales par anaérobies). *J. d'urol.*, Par., 1918, vii, 105.

Legueu refers to gangrenous cystitis characterized by the production of detached necrotic casts of the bladder wall. They are observed especially in women during pregnancy, but they also occur in men. He reports the full details of such a case in a man of twenty-one years. The patient was a soldier who, after an operation for extraction of projectiles lodged in the upper part of the thigh and pelvis, showed retention of urine. Attempts at catheterization created a false passage followed by urethrorrhagia. The catheter was passed and the urine evacuated for some days, but the bladder became infected. Urination continued under great difficulties for some weeks and the man was operated upon.

On incision of the bladder a large quantity of purulent fluid and pus escaped. Within the edges of the incision a large mass appeared covered with concretions, with a foul odor. This was thought to be a portion of gangrenous omentum which had herniated through a rupture in the bl dder wall. The mass however was found to be detached and the bladder wall intact. It was removed. The operation was ended by inserting a cystostomy tube without suturing the bladder to the abdominal wall, and placing a dressing. The recovery was uneventful, but urinary disturbances have persisted.

The piece removed was an enormous sac apparently molded on the internal face of the distended bladder. The inner surface appeared to consist of mucous membrane and the exterior surface of muscular tissue. Microscopically it was composed of thickened sclerous connective tissue and degenerated muscle fibers.

Careful bacteriologic examination of the urine was made about the time of operation and showed three types of anaerobic microbes.

In the etiology of this condition, distention of the bladder and retention have previously been considered as fundamental conditions. But retention is in fact only a ecndary circumstance. Legueu thinks that the etiology is to be sought in the anaerobic microbes which have found access to the bladder. Unfortunately in the previously reported cases either the bacteriological examination was omitted or if made, no particular attention was paid to anaerobic microbes. In the present case the presence of Jungano's bacillus was clearly demonstrated.

Diagnosis of such cases is difficult. The signs which raise suspicion are the dilated bladder, its high position and the fetid urine. In females there may be spontaneous expulsion of the membranes; this is impossible in man. W. A. BRENNAN.

Reimann, S. P., and Magoun, J. A. H.: Cholesterol Content of the Blood in Gall-Stone Disease. *Surg., Gynec. & Obst.*, 1918, xxvi, 282.

To determine the presence or absence of hypercholesterinæmia in cholelithiasis, and its value as a diagnostic point, the authors recorded cholesterol determinations in the blood of 60 patients with histories relating to upper abdominal lesions, and correlated their subsequent operative findings.

Normal values by the original Autenrieth-Funk method have been expressed, ranging from 130 to 190 milligrams per 100 ccm. of blood. Bloor's method gives readings from 7 to 30 per cent higher. Two hundred milligrams of cholesterol per 100 ccm. of blood was adopted as the upper limit of normal. Blood for test purposes was collected in the mornings after the patients had slept in the hospital at least over night.

From the figures collected, higher cholesterol readings were found in cases of right upper abdominal disease other than cholelithiasis. Four hundred and forty-seven milligrams per 100 ccm. of blood was the highest cholesterol reading obtained in the series in a case of carcinoma of the head of the pancreas. The lowest was 111 milligrams per 100 ccm. found in the case of chronic cholecystitis with stones. For 10 jaundiced patients with obstruction of the common duct from stones or carcinoma of the head of the pancreas, 276 milligrams per 100 ccm. of blood was the average cholesterol reading.

Age increases the cholesterol in the body fat. Patients over forty years of age showed a higher cholesterol value than those under forty. Those of the younger patients without stones showed higher quantities than those with stones, and vice versa in the older patients. Robertson and Burnett, through the discovery that the growth of malignant tumors transplanted in mice is hastened by the injection of cholesterol, have expressed the opinion that the prevalence of tumors as age advances is due to an increase of cholesterol.

The average cholesterol reading was 259 milligrams among the 60 patients having, not including gall-stones, carcinomata of the stomach, gall-bladder, œsophagus, appendix, and pancreas,

hypernephroma of the kidneys, myoma uteri, and papillomata of the gall-bladder. The average was 231 milligrams, excluding the jaundiced cases. Fourteen of 28 cases with stones showed a content above 200 milligrams, or about 63 per cent; in 38 cases without stones, 26, or about 68 per cent, showed a content below 200 milligrams.

As a result of the experiment, the authors found that many conditions may affect the quantity of cholesterol in the blood. Hypercholesterinæmia is not constantly present in cholesterol in the blood. Hypercholesterinæmia is not constantly present in cholelithiasis and it has no significance in the differential diagnosis. F. P. HAMMOND.

Buchanan, J. J.: Bile Peritonitis Without Evident Perforation of the Biliary Tract. *Surg., Gynec. & Obst.*, 1918, xxvi, 303.

The author reviews the history of cases in which bile has been found in the peritoneal cavity without evidence of perforation of the bile tract. He reports one case and tabulates sixteen others. He comes to the conclusion that the condition results from such diverse conditions that no definite disease picture exists.

The author's case was a boy of twelve years, who had had typhoid at two and one-half years; at eight he began to have severe attacks of cramp-like pain in the right upper quadrant, with vomiting of bile and tenderness in the gall-bladder region. When seen he was taken with colic accompanied by vomiting, slow pulse, and slight elevation of temperature. The pain and tenderness was confined to the right side. In forty-eight hours the patient was still vomiting, had a distended and rigid abdomen, and a rapid pulse.

On opening the abdomen a fluid seemingly half bile and half sero-pus gushed from the wound. The intestines were injected, the ascending colon thickened, the appendix red but not more than the rest of the intestines, the peritoneum over the mesocolon and common duct was œdematous, glassy, and green. The wall of the common duct was black and gangrenous. The gall-bladder was tense, red, and full of dark bile and muco-pus. The common, hepatic, and cystic ducts were not obstructed. No perforation was found in the bile tract, stomach, or duodenum. The gall-bladder was excised, the common duct drained, and the peritoneal cavity mopped out and closed except for the above mentioned drainage. The patient recovered with a fistula which closed in six months, and he has remained well.

The author then cites several cases to show that the peritoneum is very little affected by non-infected bile, but if infected, the bile causes a peritonitis. In discussing the tabulated cases, it is pointed out that the effusions were not tested chemically for bile, but that the physical appearances were such that the surgeons felt justified in assuming it to be bile.

The bile tract was the seat of inflammatory or carcinomatous lesions or stones in thirteen of the sixteen cases, two followed trauma, and in one typhoid ulceration was probably present.

As to the cause, filtration through the gall-bladder wall is mentioned, and earlier in the paper some experiments by Clairmont and Von Haberer are quoted in which the common duct was ligated. In four of these cases bile effusion was found without perforation. Microscopic perforation is mentioned but is considered improbable, but a very small macroscopic opening is considered a possibility and one case is quoted in which such a cause was demonstrated. The rupture of subserous intrahepatic bile canals may also be a cause, as was demonstrated in two cases by Nauwerck.

The author suggests postperitoneal perforation with distant rupture into the peritoneal cavity, and quotes a case in which the bile passed up back of the diaphragm between the pleura and ribs, down back of the ascending colon into the pelvis and then along the sigmoid and descending colon.

The author believes that drainage of the common duct after the peritoneum has been dried offers the best chance for recovery. H. J. VAN DEN BERG.

Eason, J.: Remarks on Acquired Acholuric Jaundice. *Edinb. M. J.*, 1918, xx, 158.

The history of a case of acquired acholuric jaundice or hæmolytic icterus is reported in detail. It was possible to exclude Hodgkin's disease, sarcoma, heart disease, syphilitic enlargement of the spleen and liver, malaria and kala-azar. Obstructive jaundice was excluded because the stools were of normal color and the urine contained no bile pigment.

The congenital and acquired forms of this disease possess the following in common: anæmia, diminished resistance of red cells, evidence of increased blood destruction, splenic enlargement, jaundice due to bilirubinæmia, acholuria, urobilinuria; no drowsiness, pruritus or bradycardia.

If the patient does not improve under proper climatic and hygienic conditions, splenectomy is advised. The author does not state how much benefit may be expected from splenectomy.

LISTER TUHOLSKE.

Ozaki, Y.: Phagocytosis of Bacteria in the Excised Spleen After Perfusion with Locke's Solution. *J. Med. Research*, 1917, xxxvii, 247.

The author draws attention to the fact that the phagocytosis of bacteria by fixed tissue cells has been but little investigated in comparison to that by the leucocytes, so that knowledge of the real mechanism of this phenomenon is still restricted. The principal reason for this, he states, is the difficulty of obtaining actively phagocytic cells from tissues in any form proper for *in vitro* tests.

In order to solve the questions involved he chose as the test object the spleen of the dog. It is well known, he states, that polymorphonuclear leucocytes, in spite of various kinds of treatment, such

as repeated washing, admixture with heterologous serum, etc., show their active vitality for a considerable time after they are removed from the host. And, as there are in the spleen two different types of cells, viz., leucocytes and fixed cells, he considered that it would be easy to follow the phagocytosis carried out by each of these elements under exactly the same conditions in each individual test.

Ozaki carried out a series of experiments, the results of which he has recorded in this study. The spleen of the dog he found could be fairly well preserved in an active condition for some time after its removal from the living body by means of careful perfusion with Locke's solution at body temperature. Wandering cells as well as fixed tissue cells showed, if at all, but slight necrobiotic changes, and their function was well carried out in so far as their bacterial ingestion was concerned.

In the spleen of the living animal as well as in that kept alive by means of Locke's solution the bacteria injected into the parenchyma were practically ingested by splenic cells and polymorphonuclear leucocytes, and to some extent also by endothelial lining cells and endothelial leucocytes.

In the living animal the grade of phagocytosis by the polymorphonuclear leucocytes found in the spleen was on an average far more pronounced than that by splenic cells. A similar relation was also observed, although somewhat less marked, within the spleen tissue kept alive by means of Locke's solution, provided that these cells did not undergo any, even slight, necrobiosis.

In one of his experiments, where the bacteria were injected after four hours from the beginning of perfusion, a marked phagocytosis took place in some of the splenic cells and in a few endothelial lining cells. The finding was so much the more striking, as the phagocytic activity of these cells was higher than that of splenic cells of the living animal. The real reason or significance was not apparent to the author, and he considers that the experiments should be repeated under varying conditions.

The present work showed the possibility of marked phagocytosis by adult fixed tissue cells outside the living body. From this it was also anticipated that a marked phagocytosis *in vitro* by fixed cells for the study of immunology would not be impossible if splenic cells were made use of.

GEORGE E. BEILBY.

MISCELLANEOUS

Deaver, J. B.: The Acute Abdomen. *Med. Rec.*, 1918, xciii, 47.

The most common type of acute perforation into the abdominal cavity is that of the appendix, the initial symptoms of which, however, do not differ greatly from those of an uncomplicated acute attack of appendicitis. Indicative of a perforated appendix are persistence and exacerbations of the pain and tenderness in the right iliac fossa, followed by an extension of tenderness to adjacent areas, increase of pulse-rate and of muscular rigidity, the latter being perhaps the most significant; finally the typical features of a peritonitis occur. Within the first twenty-four to forty-eight hours the operative mortality in perforating appendicitis is about 1 per cent, but it rises rapidly unless seen at this period and immediately operated upon.

Immediate operation is best in cases of appendiceal peritonitis of less than forty hours' duration. After this it is best to delay operation until the patient's condition warrants it. The appendix should be removed except when a circumscribed abscess presents the risk of spreading septic material. Remove the pus gently. Tubes are best for drainage and a glass tube through the incision or a stab wound in the pelvis is essential.

Perforating chronic gastric or duodenal ulcer is the next most common cause of acute surgical abdomen. It is characterized by pain of an intense stabbing character referred to the upper abdomen, which soon assumes a board-like rigidity. Very often the downward course of the infection toward the right iliac fossa causes extreme rigidity and is very suggestive of appendicitis. Collapse does not appear for the first hour or two, the abdomen at this stage being retracted, not distended, rigid and exquisitely tender, especially to the right of the median line above the umbilicus. Later the pulse rises, the abdomen becomes distended, tenderness becomes more marked and the symptoms of shock are accompanied by collapse. As a rule, after the first onset of pain the patient vomits, but only once. The temperature now falls and the pulse-rate increases. The previous history is very important and if this were always clear and obtainable, diagnosis would be simplified. The symptom complex of acute perforation of a gastric and a duodenal ulcer is very similar; if presented by an anæmic female, it is probably the former, and if by an adult male, usually the latter.

Every case operated upon within the first twenty-four to thirty hours should get well. After closing the perforation primary gastro-enterostomy is a good thing in skillful hands.

Acute perforating or gangrenous cholecystitis is characterized by pain which may be dull, aching, severe and continuous, with acute exacerbations, or paroxysmal as in typical gall-stone colic. It usually appears in the epigastrium, but soon localizes in the right hypochondrium. Sometimes it is referred to the right shoulder-blade and very frequently to the right iliac fossa, suggesting appendicitis, with which in fact it is often associated. Nausea and vomiting are always present and in the more severe cases tenderness and muscular rigidity is marked. Jaundice is absent as long as the common and hepatic ducts remain patulous.

The most vital point in the treatment of acute gall-bladder conditions is to operate before the toxæmia is too marked. Cholecystectomy is the operation of choice.

Acute pancreatitis may be ultra-acute, acute and subacute, the former being rapidly fatal. The acute type presents a slightly better prognosis and if the early toxæmia is survived, improvement gradually occurs and operation may be successful. The subacute type is the most common and the symptoms of pain, nausea and vomiting are less severe, causing often the diagnosis of acute indigestion to be made. The pulse and temperature are not always affected. Operation in the ultra-acute type may imperatively be immediate, but it is best if possible to wait a while to allow the body to overcome the toxins somewhat. The transperitoneal route is preferable to the extraperitoneal route as it offers free exposure of the operative field, opportunity for radical surgery and for establishment of adequate drainage. Free longitudinal incisions should be made in the pancreas and sufficient gauze and tube drainage instituted, lessening the chances of adhesions by using an enveloping sheet of rubber dam. Pelvic drainage and an antidiabetic diet are valuable.

About one-fourth of the cases of acute abdominal pain exclusive of intussusception are due to intestinal obstruction, and early diagnosis and operation affords a very favorable prognosis. The symptoms are similar to perforation of a hollow viscus except that vomiting is more persistent and continuous, the pain is more susceptible to palpation than to percussion, rigidity is absent, relaxation of the abdomen occurring between pain intervals. Abdominal friction will frequently excite peristalsis emptying the lower bowel, there being, however, complete obstruction of the upper bowel. Restlessness is quite noticeable.

The common causes of this condition are fibrous bands constricting the bowel or beneath which a loop of bowel becomes strangulated, kinking of the bowel by adhesions, strangulation of an internal hernia, sudden impaction of a gall-stone in the small intestine, sudden twist of the bowel, sudden stricture of the small intestine or colon. Operation, when done early enough, usually results satisfactorily. The Fowler position and Murphy method of enteroclysis are invaluable in pre-operative treatment. Ice bags also are of value in relieving pain and lessening peristalsis. H. H. FRELICH.

Seguinet: A Study of 47 Abdominal Wounds Treated in a Division Ambulance (Étude sur 47 plaies de l'abdomen traitées dans une ambulance divisionnaire). *Bull. et mém. Soc. de chir. de Par.*, 1918, xliv, 111.

Of 47 abdominal wounds observed by Seguinet, 46 were operated upon. Twenty cases were treated during a lull, and 26 cases during active fighting. The cases were laparotomized and the lesions treated.

The following results were obtained: Of the 20 cases treated in a calm period, 13 presented unisceral lesions, giving 4 deaths and 9 recoveries; 7 presented multivisceral lesions, giving 4 deaths and 3 recoveries.

Of the 26 cases treated during a period of active fighting, 12 non-operated cases gave 12 deaths; 14 operated cases gave 9 deaths; 2 cases were evacuated; there were 3 recoveries.

The results in the first group show that 50 per cent of small intestine wound cases recover even when complicated with other lesions. In these cases it should be remarked that the patients were received for treatment within three hours after injury.

The 75 per cent mortality in the second group of cases is due, according to Seguinet, to the distance of the ambulance from the front line, to the necessary, rapid, and frequent evacuations, to insufficient skilled assistance and indifferent equipment, all of these factors being more or less due to the condition of fighting and the overcrowding of the ambulances. W. A. BRENNAN.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Day, H. F.: Observations on Disabled Shoulders. *Boston M. & S. J.*, 1918, clxxviii, 389.

This article gives a differential diagnosis of most of the common injuries to the shoulder-joint and deals particularly with the discussion of the etiology, treatment and prognosis of subacromial bursitis.

The author has based his study on cases seen in private and hospital practice, and in the article gives a tabular view of 64 subacromial bursitis cases in the out-door department of the Peter Bent Brigham Hospital.

He has divided the disease into three types, the acute, subacute and chronic. In the acute stage he says that pain is the outstanding complaint and is accompanied by limited abduction. In the subacute, limited motion due to adhesions is the main diagnostic point; and in the chronic type, the adhesions having generally broken up, abduction is again possible but often painful, due to roughening of the bursa.

As to treatment, briefly he advises bed treatment for the first few days with the arm held in abduction and external rotation, aspirin being given to control pain. In the subacute type, he suggests, first, gradual stretching; second, repeated forcible breaking up of adhesions; and third, an operation which he describes. In the chronic cases he considers that patience combined with exercises, baking, and massage are necessary.

In conclusion he says, "Subacromial bursitis is a

definite demonstrable disease and has certain characteristic symptoms. Its prognosis is ultimately good. Its cure can be hastened by proper treatment."

Juaristi, D. V.: The Abscesses of Pott's Disease (Los abscesos del mal de Pott). *Prog. de los clin.*, Madrid, 1918, vi, 5.

In a well illustrated and lengthy article Juaristi considers the anatomical and clinical aspects of the various types of abscess associated with Pott's disease. The treatment preferred is absolute rest with protection of the infected region and evacuation of the abscess. The evacuation should always be by puncture, never by incision, a fine trocar being used with an aspirator.

Various liquids and pastes are injected into the abscess cavities according to indications. These are principally composed of camphorated naphthol with glycerine, iodoform, ether, creosote, guaiacol, etc. The formulæ and indications are given. Iodoform ether should generally not be injected except in small residual abscesses, as it causes strong distention of the walls and may occasion rupture.

A detailed study of various regional abscesses is given.

W. A. BRENNAN.

Feldman, M. H.: Possible Relationship of an Oral Focus to Chronic Osteomyelitis. *Dental Cosmos*, 1918, lx, 147.

Scientific investigations to determine the exact relationship existing between systemic disorders and oral foci seem to be resulting in the collection of no small amount of evidence which tends to lay responsibility for many ills at the door of the oral cavity.

The author reports the case of a male aged thirty-six who, twenty-one years prior to his admission to the dental operating room, had had an osteomyelitis in his right femur of such severity that the leg was amputated at the hip-joint. During the years following, the patient had more than thirty operations on various parts of his body. Osteomyelitis had been found in the left leg, elbows, arms and inferior mandible. Radiograms of the teeth were made and six lower incisors were extracted. The author believes that these teeth had been the focus of infection for more than twenty years.

P. H. KREUSCHER.

Waterhouse, H. F.: The Treatment of Tuberculous Disease of the Larger Joints and of the Spine. *Practitioner*, Lond., 1918, c, 8.

Early treatment means early diagnosis. Make the diagnosis before destructive and degenerative changes have occurred. The author has great faith in Koch's new tuberculin as an adjunct to treatment. This he uses as a routine in doses from 1:20,000 mg. to 1:1,000 mg. graduated for twelve weekly injections. Those cases which withstand the drug well may be given more, even to 1:250 mg.

Bier's hyperæmic treatment is also employed in every case of joint tuberculosis below the upper arm and below the thigh.

A 10 per cent emulsion of iodoform and glycerine is used to stimulate fibrosis and encapsulation of the tuberculous focus.

Tuberculosis of the hip is essentially a disease of childhood. The destructive process brings about an absorption of the head of the femur and the acetabulum with displacement of the neck backward.

The first indication in treatment is rest. Then apply weight extension to the limb in an abducted position in order to relieve muscular spasm and pain, and to keep the softened bony ends separate. After all pain, tenderness and muscle spasm have ceased, ambulatory treatment with a Thomas hip splint is employed.

Tuberculosis of the knee usually begins in the synovial membrane. A bony focus exists in almost every case in children. The focus occurs as frequently in the tibia as in the femur. A diffuse infiltration and thickening of the synovia commonly takes place. The knee tends to be flexed. The tibia may be displaced backward on the femur by the hamstrings, and rotated outward by the biceps.

The treatment in children is non-operative because of their power of resistance, and in order to avoid any disturbance of growth in the epiphyses. In adults operative treatment is indicated even with resulting ankylosis, because resistance is poor. Weight extension is used in knee tuberculosis.

In the ankle the synovia is usually involved. Fix the foot at right angles and keep it immobilized.

If the shoulder-joint is involved in adults, keep the arm slightly abducted, the elbow flexed and the thumb up.

The characteristic deformity in tuberculosis of the elbow is partial flexion of the forearm at an angle of 130°, and the arm pronated. To correct it, fix the forearm in such a position that it makes with the arm an angle less than a right angle and have the hand semipronated.

The primary point of attack in the wrist is the synovia. The hands and fingers are flexed and a bulbous swelling appears at the wrist. Dorsiflexion is the position for correct treatment.

In the spine, tuberculosis begins as an osteomyelitis in the anterior part of the bodies of one or two vertebræ. In adults the process is a periosteitis. Abscess complicates spinal tuberculosis more than it does tuberculosis of any other joint. Never introduce a drainage tube into such an abscess, for secondary infection always occurs. Paraplegia not infrequently is found. This is always motor and due to an extradural tuberculous granulation tissue. Treatment is absolute rest in a recumbent position. After all pain, spasm and tenderness have ceased, a jacket of plaster of Paris or leather is used.

JOHN MITCHELL.

Ridlon, J.: Difficulties in the Diagnosis of Hip Disease; a Case of Osteo-Arthritis. *Surg. Clin. Chicago*, 1918, ii, 223.

The difficulty in diagnosing some cases of hip disease is well brought out in Ridlon's article. He

cites a case of osteo-arthritis which has many of the ear-marks of a tuberculosis, but without corroborating X-ray findings.

The patient, an unmarried woman of thirty-four, was run over by a light wagon at the age of twelve. She soon recovered and remained well for five years. At the age of seventeen on turning over in a sleeping berth, something happened to the right hip and she was unable to walk. From this she soon fully recovered. Five years later she developed periods of lameness in the right leg and pain in the right knee. In 1906 she became so lame that she took baths for rheumatism. In May, 1907, she had recurrence of the lameness and in July was put to bed with extension. After getting up she wore a brace and walked on crutches for five years. During 1913 she had extension for three months and a plaster cast for twenty-three weeks. Then she considered herself practically well. Later she had a fall and the hip became so bad that she was unable to walk. She had a temperature, and an abscess was feared. A cast was again applied. At the time the case was reported she complained that the limb was sore all the time and that there was pain. She had some indigestion. She had one bad tooth that ached whenever the hip ached.

Examination showed the right leg three-fourths of an inch shorter than the left, but no deformity at the hip.

The history of periodic attacks covering several years, the pain at the knee, the temperature, and the "abscess feared," strongly suggested a tuberculous hip, but the lack of atrophy of the calf and particularly the absence of flexion and adduction deformity of the hip made that diagnosis doubtful. The X-ray showed one-half an inch of erosion into the upper border of the acetabulum and at least two-thirds of the femoral head destroyed. Deposits were seen along the upper border of the neck at least one-sixteenth of an inch thick and a similar deposit extended out from the border of the acetabulum, as if the capsule had been thickened and then calcified. From the X-ray findings Ridlon believed that a diagnosis of osteo-arthritis was warranted. G. W. Hochrein.

Gill, F. L.: Gunshot Wounds of the Knee-Joint. *Med. J. Austral.*, 1918, i, 102.

The diagnosis of septic arthritis of the knee is often a difficult matter, especially where there are septic wounds of other regions. The diagnosis rests upon: (1) rising temperature; (2) high pulse-rate, 120; (3) increase in the degree of distention of the joint; and (4) aspiration, which should always be done before operation.

A favorable prognosis of gunshot wounds of the knee depends upon: (1) early complete immobilization and rest; (2) the early removal of all shell fragments that lie within the joint; (3) disinfection of the septic joint by the Carrel-Dakin method, the termination being an ankylosed joint.

R. B. Cofield.

Perera, A.: New Methods in the Treatment of Tuberculous Osteo-Arthritis of the Knee-Joint (Nuevas orientaciones en et tratamiento de las osteo-artritis tuberculosas de la rodilla). *Prog. de los clin.*, Madrid, 1918, vi, 57.

The use of immobilizing bandages is indicated only in arthritis with an acute onset, in painful arthritis, in tuberculous hydrops with notable œdema and in fungous synovitis. It is contra-indicated in abscesses and after any surgical operation. For correcting a vicious position traction and massage of the muscles is employed. Celluloid is the best material for immobilizing the joint. Plaster is one of the worst materials and the fenestrated cast is especially bad. Its indications in connection with injections or roentgenotherapy are extremely limited.

Functional rest should be rigorously insisted upon without fear of ankylosis.

Of the various substances injected into the articulations or with abscesses the author recommends only iodine associated with olive oil, glycerine or creosote. They are useful in fistulous tracts and deep abscesses; but the quantity should not exceed 40 ccm. They are contra-indicated in acute processes and when there are multiple abscesses.

Various other injection substances recommended in literature have been tried and have been proved useless or harmful.

The treatment by exposure to sunlight in clear and cold air, if the patient's state does not contra-indicate it, gives the most positive results in this disease. In 80 per cent of closed bone lesions heliotherapy however does not stop the tubercular process and in 20 per cent of the cases it aggravates it. This type calls for an open operation. Heliotherapy cures open bone lesions. In closed synovial lesions heliotherapy cures; it takes much time especially in adults and there may be cases in which it aggravates. In open synovial cases heliotherapy may cure, but it does not aggravate. In cartilaginous and multiple lesions either closed or open, heliotherapy is the only treatment that cures, whether the case is incipient or old.

With regard to operative procedures, extra-epiphyseal tuberculous foci when existing ought always to be excised. Typical resection is only a means of last resort in children; in adults it is preferable to amputation. Arthrectomy ought to be done in the beginning of a pure synovial lesion.

These remarks apply to other joints as well as to the knee. W. A. Brennan.

Desplats, R., and Buquet, A.: Obliteration of the Limb Arteries and Circulatory Nerve Disturbances; Nervous Ischæmia of the Wounded (Obliteration des artéres des membres et troubles circulatoires des nerfs; l'ischémie nerveuse des blessés de guerre). *Rev. de méd.*, Par., 1918, p. 578.

Vasomotor, trophic and similar disturbances in the wounded have been considered to be of nervous

origin. The great frequency of concomitant arterial wounds with other wounds of the limbs has drawn attention rather to the part played by the vascular lesion.

The authors give details of 5 severe injuries of the limb arteries. From their close study the authors conclude that such vascular wounds when they end in complete obliteration of these great trunk vessels are capable of causing paralytic, anæsthesic and trophic disturbances clearly imputable to the degeneration of the nerves at their extremity. Such disturbances more especially follow injuries of the axillary artery probably due to special anatomic conditions. They have not particularly observed such disturbances in the lower limb. They do not say that such do not occur, but they confine themselves to what they have observed. One fact has struck them, namely, that ligation of the femoral artery, which so often causes gangrene that the surgeon is obliged to amputate within a few days, rarely provokes isolated ischæmic neuritis with concomitant paralysis, anæsthesia, etc., which appears to arise from a parenchymatous degeneration of the nerve. However, there are some less noticeable nervous disturbances due to a more transitory and less complete ischæmia.

These findings instigated further investigations of the motor, sensory, and trophic effects of severe arterial lesions. The authors have therefore systematically examined all cases of wounds of the large and medium arteries which came to their service. Some typical cases are detailed.

Sensory and other disturbances are more common in the upper limb than in the lower and follow the same order as the symptoms found in ischæmia of the axillary artery except that they are much less in degree. The limb is atrophied but œdematous toward the extremity; sensory and motor disturbances are slight; the electric reactions are modified; the nerves, while they have lost their direct excitability, have not lost their conductivity; there is a tendency to finger deformity.

The reason why circulatory disturbance of the nerves does not more frequently follow obliteration of the lower limb trunk vessels the authors believe is to be found in the less elaborate collateral system in the lower limbs than in the upper.

Obliteration of the arterial trunk of the limbs is in itself sufficient to explain trophic and other disturbances, outside of any concomitant nerve lesion. In the upper limb the syndrome may be completely established when the lesion is in the dangerous zone of the axillary artery. This syndrome consists in: (1) paralysis of the ulnar, median and radial; (2) degeneration over the same territory; (3) complete anæsthesia at the finger ends; (4) characteristic finger deformity. In the lower limb the same syndrome seems to appear only theoretically in the isolated state, because it is masked by gangrene. When gangrene does not develop, the syndrome shows in an attenuated form; it is early, and rapidly vanishes.

The surgical treatment must be directed toward both arterial and nerve lesions if such are concomitant, as happens in the majority of cases.

W. A. BRENNAN.

Delitala, F.: Partial Amputation of the Hand (Le amputazioni parziali della mano). *Chir. d. organ. d. mov.*, Bologna, 1917, i, 595.

The most frequent causes of partial amputation of the hand are hand grenade and bomb wounds. These form 68 per cent of 54 cases. In 14 per cent of the cases the lesion was due to an accidental explosion.

The most frequent type of mutilation is the total loss of one or more fingers, forming 42 per cent, while partial loss occurs in 20 per cent.

Carpometacarpal disarticulation occurs in 15 per cent and bilateral amputation in 8 per cent of the cases.

The author's article gives a detailed description of the plastic methods employed in treating the stump, after the usual surgical cleansing and treatment of the wound. Endeavor is made to preserve every particle of vital functioning tissue, as such can be used to good purpose in the later plastics; also the fixation of various prosthetic appliances to take the place of the missing parts. These are extensively illustrated for every type of mutilation.

W. A. BRENNAN.

FRACTURES AND DISLOCATIONS

Woolsey, R. A.: Fractures of the Humerus. *J. Missouri St. M. Ass.*, 1918, xv, 50.

Adequate fixation of the humerus is especially difficult, which accounts for the frequent cases of non-union, malunion and delayed union. Ununited fracture is often the result of surgical impatience. Even a fibrous union, given time and aided by efforts to promote calcification, will often terminate in a solid bony junction. In compound fractures have the field cleansed with 5 per cent tincture of iodine, insert a long nozzled glass syringe filled with the same solution to the bottom of the wound and expel the iodine at this point.

In all fractures of the humerus that can be properly reduced, the best fixation dressing is a crinoline cast, which, if of the proper grade, will be just as strong and many times less heavy than plaster of Paris. A splint of cigar box material cut in quarter of an inch strips and stuck to adhesive plaster in such a way as to conform to the rotundity of the limb is often of great value and should be used under the crinoline cast, being applied over sheet cotton alone. It should include the shoulder to the neck and be applied as a spiral figure eight that extends across the chest and under the opposite axilla; should include the elbow at a right angle with the forearm semiprone; should not include the wrist and hand to avoid subsequent stiffness. The entire forearm and hand should be carried in a sling.

When a fragment rides up from muscular action,

the companion fragment must be so adjusted as to correct the deformity. Overriding in oblique fractures is corrected by extension and permanent traction to the arm placed almost at right angles to the body. A simple appliance for this is described. Fractures that are impossible to reduce or retain should be plated. Non-union must be plated or autogenous bone graft used. Fixation with plates, nails or screws in fractures near or in joints is important. A crinoline cast is also used.

CARL R. STEINKE.

Leriche, R.: Primary Subcapsular Periosteal Resection in Articular Fractures Due to Gunshot (De la résection sous-capsulo-périostée primitive dans les fractures articulaires par pénétration de projectiles d'artillerie). *Presse méd.*, Par., 1918, xxvi, 85.

In the last session of the Interallied Surgical Congress the conclusion was reached regarding the treatment of articular fractures that primary resection is at present only exceptionally indicated; and that it should be discontinued as a method of obtaining the best functional results; the care of correcting defective functional results should be left to deferred orthopedic resections.

Leriche thinks that these conclusions cannot be accepted without discussion. He discusses at length the value of primary resection. Numerous statistics have shown that resections have generally given bad results, but according to Leriche they show merely that the proper means of doing a resection is not known or generally practiced. So-called Ollier resections are done without following his strict technique or using his precise instruments.

When a subcapsular periosteal resection is primarily done strictly according to technique, with the constant view of assuring future functioning by respecting the soft tissues and observing minute operative details, it gives in penetrating articular fractures the same functional results that the Ollier method gives in the secondary period.

The author gives the statistics of all articular lesions observed in his service received between the fourth and eighteenth hour after injury. Of 69 cases received, 3 died almost immediately from the gravity of the wounds; 5 had a primary amputation or disarticulation; 1 had a secondary amputation. There were 22 arthrotomies and 37 typical resections. If the immediate deaths and primary amputations be deducted, there were 61 articular lesions giving an immediate operative indication in which there has been no death and only 1 failure. The 37 resections gave 98 per cent successes.

Leriche's service deals only with evident fracture cases. During the period in which his 69 cases were treated, 24 articular soft part injuries were treated in the same surgical unit, 23 being arthrotomies, and 1 resection. Combining both statistics, Leriche finds that of all articular wounds received in his surgical unit, 5 to 6 per cent were amputated, 52 per cent were arthrotomized and 48 per cent were resected. These figures therefore refute the assertion that resection is only exceptionally indicated at the present time. In free penetrating articular fractures not complicated by severe neighboring lesions, resection only failed once. In the foot, especially in severe tarsal injuries, resection has conservative indications.

The field for subcapsular periosteal primary resection ought not to be restricted, as it can materially reduce the number of primary and secondary amputations. In order to obtain exact ideas as to the treatment of articular fractures, statistics of certain procedures should not be relied on but only the total results, including primary deaths and amputations.

W. A. BRENNAN.

Faulds, A. G., and Teacher, J. H.: A Most Unusual Case of Pathological Fracture; Myeloid Sarcoma and Cystic Disease of the Bone. *Glasgow M. J.*, 1917, lxxxix, 17.

The authors report an unusual case of pathological fracture of the femur occurring in a woman of thirty. Three months before her admission to the hospital, as she was going down stairs, "her leg went under her." It was found that she had a fracture of the femur at about the junction of the upper and middle thirds. A splint was applied but at the end of three months union had not taken place.

X-ray examination indicated that disease had been the cause of the fracture. The patient was operated upon with the object of removing a piece of bone and surrounding tissue for diagnosis by the pathologist. The bone and surrounding tissue were of a yellow-greenish hue and the bone was abnormally soft. Based on the clinical findings, amputation of the limb at the hip was performed.

The patient improved and was dismissed when the stump had healed, some seven weeks later, complaining, however, of pain in the other thigh. The pathological report revealed cavities in the neck of the femur with thin bony walls. The cyst practically stopped at the epiphyseal line, the actual head presenting a fairly normal appearance. There were cavities in the lower fragment of the neck and in the shaft down to the fracture. There was no apparent tumor. In the tibia there were two areas which yielded under the finger. They were covered by periosteum and were of dark color. No abnormal areas were found in the other bones. Portions of soft tissue were taken from various parts of the femur, all of which proved to be red marrow, except one small brown mass which was found to be myeloid sarcoma.

E. B. FREILICH.

SURGERY OF THE BONES, JOINTS, ETC.

Ceccarelli, G.: Post-Traumatic Ankylosis of the Elbow and Its Surgical Treatment (Anchilosi post-traumatiche del gomito e loro trattamento chirurgico). *Riforma med.*, Napoli, 1917, xxxiii, 1173.

The author gives the details of a case of post-traumatic ankylosis of the elbow-joint in a girl of

sixteen years. The forearm was completely fixed on the arm in incomplete extension at an angle of 120 degrees in a position intermediate between supination and pronation.

The osseo-fibrous growths were removed and strips of fascia lata removed from the middle third of the thigh and interposed accurately over the radial stump and fixed with a few catgut stitches.

After fifty days the patient left the hospital showing perfect flexion; extension was 165° and there was almost normal pronation and supination. After a long period, the elbow preserves its normal conditions.

The author thinks that fascia lata strips fulfil the three important functions which any interposed material should furnish, namely, to prevent the resected surfaces again coming into fusion by contact; to obviate osteogenesis of the resected ends; and to diminish the very sharp pains occurring shortly after intervention when active or passive movements of the joints are made.

W. A. BRENNAN.

Jean, G.: Late Articular Resections (Résections articulaires tardives). *Lyon chirurg.*, 1917, xiv, 1055.

The author gives short histories of more than 60 cases of late resections on all the large joints.

Shoulder-joint resection almost always gives good results with sufficient mobility.

For the elbow-joint the author recommends Ollier's subperiosteal resection, following it as typically as possible. The postoperative treatment demands special care. The surgeon himself should personally see to the dressings, immobilization, and passive and active movements, to obtain a perfect functional result with a mobile joint.

Resection of the wrist-joint gives only slight mobility.

Resection of the hip is always very serious and the author's cases have given an 80 per cent mortality. He prefers an anterior incision because it preserves the insertion of the pelvi-trochanteric muscles.

Fractures of the knee are always dangerous and the author recommends immediate amputation: (1) in old and discharging fractures with fever and a bad general state; (2) when the length of the injury exceeds 10 cm.; (3) when the principal injury is tibial. Resection is recommended when the general state permits; abstention with general curettage and heliotherapy is recommended for cases with ankylosis and fistula.

Resection in the ankle-joint, astragalectomy without removal of the malleolus, gives satisfactory results.

Partial amputation of the foot seems preferable to the author for severely infected fractures of the tarsal bones with large defects in soft parts, whereas in old fractures with a fistula, curettage alone often brings about complete recovery.

W. A. BRENNAN.

ORTHOPEDICS IN GENERAL

Walker, J. B., and Cody, C. C.: Organization of a Hospital for the Treatment of Fractures. *South. M. J.*, 1918, xi, 242.

The first hospital adapted to the special treatment of fractures is now being organized with one thousand beds. The hospital will be built on the unit pavilion basis, thoroughly supplied with modern equipment, and located somewhere in France. To this hospital it is intended to move the more serious cases of fracture of the bones of the extremities, especially those of the femur and humerus. In the organization of this hospital it is proposed to have the personnel composed of skilled surgeons who have devoted particular attention to the treatment of fractures.

In working out the plans for a special fracture hospital, attention has not been confined merely to the buildings and methods to be pursued therein; but the problem has been taken up from the beginning. No treatment for fractures can be satisfactory which ignores the methods pursued before the wounded soldier enters the hospital. The treatment must be so systematized that the soldier will be under one method from the time he is injured until he leaves the hospital. This is the only rational procedure, and haphazard methods can only result in inevitable disappointment.

In order to make this plan effective, two things must be accomplished: first, the adoption of a standard method of treatment; and second, training each surgeon in the use of the standard appliances, and giving him a definite realization of the part he is to play in the treatment of fractures. The latter is the more formidable of the two, and is already in the process of accomplishment by the establishment of intensive courses of instruction in standard methods for the treatment of fractures.

The purpose of this course of instruction is to familiarize medical officers with standard methods in the treatment of fractures. It is intended that officers so trained will not only serve in the special fracture hospital but in field, base, and general hospitals, and also serve as regimental officers, so that a continuity in the methods for treating fractures can be maintained. By this means it is proposed to establish team work on the part of medical officers throughout the army in order that the wounded soldier will receive promptly the most efficient treatment, whether at the regimental aid station, the dressing station, the field hospital, the evacuating hospital, or the base hospital, as well as along the lines of transportation.

The logical results of this co-operation will be to secure early recovery, lessen deformity, and reduce to a minimum the number of soldiers permanently disabled. It is realized that the exigencies of the service in the zone of the advance will frequently be such as to render the standard methods impracticable, but by indicating clearly the desideratum it is hoped that the difficulties in the field will act less

as an obstacle than as a stimulus to the ingenuity of the medical officers.

Nearly all war fractures are compound, so that any treatment which considers merely the fracture and not the wound and the soldier would be quite ineffective. Consequently, the course of instruction will be initiated with a brief but thorough presentation of wounds from a military standpoint, their causes and their treatment. This will be followed by the course in standard methods for treating fractures proper. The instruction will be intensely practical in nature, consisting in the demonstration of the splints, their adaptability and application.

The instructors, who are all eminent surgeons, have been supplied with an outline of the course to be presented so that uniformity of instruction is assured. It is intended that the medical officers on the completion of the course will return to their several camps and thus become a focus of information on the standard methods for the treatment of fractures. In this way, the practical methods of technique will be very rapidly disseminated among the medical officers.

Such a paper is manifestly inadequate for the proper presentation of the splints which have been adopted as standard, or for a detailed discussion of their points of superiority; but suffice it to say that they have proven their value under the conditions that this country will be called upon shortly to face.

Too much emphasis cannot be placed upon early and adequate surgery in the treatment for fractures. Only the shortest possible time should be allowed to elapse from the time the fracture occurs until adequate extension, reduction, and wound antisepsis is inaugurated in order to protect the integrity of the muscle, lessen the nerve trauma and the pain, and promote early healing. The simple statement of the proposition is so self-evident that it is the proof. Consequently, it is insisted that standard methods be inaugurated just as close to the firing lines as is practicable, and that they be maintained along the lines of transportation in order that the patient reach the hospital in the very best possible condition. The advantages of such an organization for the special treatment of fractures is quite evident from a military, economic, and surgical standpoint.

E. C. ROBITSHEK.

Royle, N. D.: The Neuromuscular Re-Education of the Soldier. *Med. J. Austral.*, 1917, ii, 453.

The pathological lesions or rather the conditions affecting the neuromuscular organization of the soldier may be purely psychic. Shell shock is a common cause. For instance, a bullet wound through the shoulder region without injury to the brachial plexus may lead to a total loss of function of the upper limb. The type of paralysis may be of the flaccid or the spastic type.

The pathological process may be anatomical, as (a) gunshot wounds of the cerebral cortex and spinal cord; (b) disease or injury to the peripheral nerves; (3) muscle injury and infection, including ischæmia; (4) arthritic conditions such as ankylosis leading to a severe type of paresis.

The treatment of these conditions is psychophysical on one hand and mechanical on the other. Massage, baths, and manipulation of the joints must be systematically carried out. Electricity is of doubtful value, except in the psychical cases. Here the high frequency is of much value especially when the patient sees the violet ray of the glass electrodes that are being used on him. Nerve and muscle re-education are of the utmost importance and great benefit is derived therefrom.

Nutrition of the muscles must be maintained and this is best obtained by the whirlpool baths, followed by systematic massage. The Swedish system of exercise is a valuable adjunct. Last but not least, the persons giving the massage and other passive exercise must have a high degree of skill, together with a thorough knowledge of the anatomy and physiology of the part.

J. J. KURLANDER.

Parker, C. A.: Non-Operative Clinic Illustrating Therapeutic Measures Employed in a Variety of Orthopedic Conditions. *Surg. Clin. Chicago*, 1918, ii, 213.

Parker presents thirteen cases, including one of cerebral spastic paralysis, four of infantile paralysis, three of knee-joint tuberculosis, one each of tuberculosis of the os calcis, congenital club-foot, epiphysitis, leg ulcer, and scoliosis.

These cases represent various stages of disease and the effects of various methods of treatment.

In the infantile paralysis cases he brings out the point that ambulatory braces should not be applied until the limbs are placed in the proper position with the knees extended and feet at right angles to the legs and that lack of attention to this particular is responsible for much disappointment in the use of braces.

In the tuberculous knee cases he calls attention to the orthopedic rule that a cast should never be removed from an inflamed joint until one is ready to immediately apply another. Neglect of this rule is responsible for much misery in joint surgery. In this connection he also warns against allowing a patient with a flexed and inflamed knee to step upon the injured limb, even if the knee is in a cast.

In conclusion he shows two photographs illustrating the result in a case of an extensive burn of the neck treated by adhesive plaster strips and an apparatus to prevent contractures. The original condition and method of treatment was reported in the June number of the *Surgical Clinics*. He says that most of the scar is as soft and pliable as normal skin, though there are numerous small ridges of scar tissue.

G. W. HOCHREIN.

Mayer, L.: The Application of the Physiological Principle to Tendon Transplantations. *Am. J. Surg.*, 1918, xxxii, 1.

To secure the best results from tendon transplantation the author sought to answer two questions

namely: "How do tendons glide?" and "What is their tension?"

By studying the anatomy of the tendon and its sheath, the author answered the first query. The sheath acted as a fluid buffer so situated as to lessen friction. Only such tendons as changed their direction were provided with a sheath. The achillis had no sheath, but was surrounded with areolar tissue which permitted motion. The sheath was a synovial lined cavity containing serous fluid. Within the sheath was a loose areolar tissue, the mesotenon, continuous with the paratenon without the sheath. A delicate fold of loose connective tissue from without the sheath was continuous with the mesotenon within. This served to shut off the sheath cavity. From the mesotenon the tendon derived its vascular supply.

From this study the author formulated these rules:

1. Use the sheath of the paralyzed tendon as a pathway for transplanted tendon. Thus a physiological environment is established for the tendon.

2. Supply the tendon with an investment of loose gliding tissue. For example, in substituting the peroneus longus for the tibialis anticus, one meets the fascia separating the two muscle planes. To perforate the fascia would give rise to adhesions. The deep surface of the fascia which is coated with areolar tissue can be used for the pathway of the peroneus and thus avoid adhesions.

3. Begin early function of the tendon. The trauma of operation gives rise to adhesions. No danger of separating the tendon from its new insertion arises if the tendon is buried beneath the periosteum of the bone.

Experimentation gave the explanation of the second question. The tension of a tendon was found, by actual scale measurement, to be zero when the origin of the muscle and the point of its insertion were brought as near to each other as possible, that is, in a position of maximum muscular relaxation. Therefore to suture a tendon under normal tension the limb must be held in such a position that the origin of the muscle whose tendon is to be transplanted and the new point of insertion are approximated as nearly as possible. For example, in substituting the peroneus longus for the tibialis anticus, the foot should be dorsiflexed, adducted and supinated.

By following up his experiments in operative work, the author was able to secure good results. The normal freedom of the tendon was assured and the unparalyzed muscle accurately assumed the function of the paralyzed. JOHN MITCHELL.

McCarthy, E. A.: The After-Care of the War Cripples. *Boston M. & S. J.*, 1918, clxxviii, 37.

Orthopedic surgery has done much toward a change of viewpoint in handling war cripples. In the past wars it was the practice, if a man was discharged as totally or partially unfit for further service, to give him a pension and allow him to shift for himself.

The enormity of the present conflict is such that this attitude by any nation toward its disabled soldiers would be an economic catastrophe.

It has been the plan by those in authority in the Medical Department in this country to pursue a course similar to that inaugurated in Great Britain by Sir Robert Jones, i.e., the establishment of reconstruction hospitals and curative workshops in different centers in the United States where orthopedic and other treatment can be instituted, and manual training carried out.

Knowledge gained in the treatment of war cripples will greatly improve the present methods in caring for the industrial cripple. R. B. COFEILD.

Hughes, M. O.: Some of the Limitations of Military Orthopedic Surgery. *Med. J. Austral.*, 1917, ii, 451.

In performing late nerve suture, latent sepsis is often lighted up and the results are failures. Pus cavities have been found in the long bones three months after the wounds have healed. Severe scar formation renders operation more difficult and interferes with rapid clean repair.

In seven cases of arthroplasty for bony ankylosis of the elbow, the results were good in six. The results in nine cases of arthroplasty of the finger were good in eight cases. There was an excellent result in a case of ankylosis of the lower jaw, a flap of temporal fascia being interposed. There were three cases of bone grafting for defects of the mandible, tibia and radius, a successful result being obtained in the radius only. Adherent scars to muscle were relieved either by excision or by the interposition of a flap of fascia lata. Fascia lata is quite resistant to infection, and has also been used to repair a gap of 7.5 cm. in a flexor tendon.

In operating on nerves for paralysis, the results were brilliant when the condition was due to pressure of a bullet. Results were also good in freeing a nerve from a callus or scar. In a series of eighteen cases of nerve suture the results were not very encouraging. If the general results are failures, the author thinks it best to resort to tendon transplantation. J. J. KURLANDER.

SURGERY OF THE SPINAL COLUMN AND CORD

Mayer, L.: A Method of Draining the Bodies of the Vertebræ; Preliminary Report. *J. Am. M. Ass.*, 1918, lxx, 593.

Symptoms suggestive of osteomyelitis of the spine in a case of sepsis due to infection by the streptococcus viridans led Mayer to work out a technique by means of which the bodies of the vertebræ may be rendered accessible to surgical intervention where necessity requires. Though the patient in question recovered before Mayer had an opportunity

to try his technique, nevertheless he has worked out a method on the cadaver which appears to be very satisfactory.

To approach the body of the vertebra an oblique route will have to be followed, which will enable the operator not only to bring his instrument to bear on the body of the vertebra, but also to see it accurately. This he accomplishes by the following technique, the essential part of which consists in the upward retraction of a wide muscular flap.

Assuming that the first and second lumbar vertebræ are diseased, a six-inch longitudinal incision is made a little to the left of the midline, and at the outer border of the iliocostalis muscle a second longitudinal incision corresponding to the first is also made. These are joined at their midpoint by a transverse incision. The skin flaps are dissected upward and downward, exposing the thick mass of the spinal muscles, that is to say, the multifidus spinæ, semispinalis dorsi, iliocostalis and longissimus dorsi.

To prevent hæmorrhage, a hæmostatic suture is now inserted, beginning at the upper outer angle of the wound, running down to the lower angle, across to the spine and upward along the spinous processes. The suture must be taken sufficiently deep to reach the middle layer of the lumbar fascia on the outer side, and the lamina on the spinal side. Corresponding to this suture, a muscle flap is outlined with its base upward, and the entire muscular mass thus freed is drawn toward the head of the patient with strong retractors. This exposes the laminæ and transverse processes of the vertebræ in question; and the corresponding portion of the middle layer of the lumbar fascia.

It is a simple matter now to resect the transverse processes at their base. Working from the outer angle of the wound, the operator's finger can readily free the psoas from the body of the vertebræ. Then, by using an appropriately shaped instrument, he can retract the psoas and the quadratus lumbórum so that he can see the body of the vertebra and with a long burr bore a hole into it and follow up this procedure with a curette. At this level the nerves are of comparatively little significance. However, they can be found and injury avoided if the operator is careful.

After suitable drainage has been instituted, the wound is closed by bringing the muscle flap down into position, suturing it in place and suturing the skin at all points except those at which the drainage tubes emerge.

In the dorsal region the technique is somewhat more difficult because of the ribs, but it is comparatively simple to resect the rib in addition to the transverse process. G. W. Hochrein.

Richardson, E. H.: The Interpretation of Lumbosacral Backache in Women. *South. M. J.*, 1918, xi, 139.

Backache is not merely a complaint to be vaguely associated with neurasthenia, but indicates the definite existence of a specific pathological condition which materially discounts the efficiency of the individual.

To determine the etiology of lumbosacral backache in women, a careful study is necessary, both from the standpoint of an orthopedic surgeon and of the gynecologist.

The orthopedic surgeon should make a careful study of the lower spine, the lumbosacral and sacro-iliac articulations for evidences of arthritis, of injury, and of chronic strain from various causes such as bony abnormalities, unequal length of the lower extremities, faulty attitudes, etc.

Whatever the nature of the particular gynecological disorder found, it produces lumbosacral backache only through the strain incident upon the faulty posture which the individual has gradually assumed in order to miminize the pelvic discomfort.

No matter how skilfully the operative therapy may be executed, it will often fail utterly to relieve the backache unless supplemented by orthopedic measures which will restore normal balance.

R. B. Cofield.

Lance, M.: Experimental Study of the Methods of Forbes and Abbott in the Treatment of Severe Scoliosis (Étude expérimentale des manœuvres de Forbes et d'Abbott dans le traitement des scolioses graves). *Rev. d'orthop.*, Par., 1918, p. 405.

The author has made a number of experimental studies on normal and scoliotic children to test the value of the methods of Forbes and Abbott for the correction of severe scoliosis.

The author distinguishes the following movements of the vertebral column: anteroposterior movements, lateral movements, movements of torsion on a fixed point, and movements of torsion between two fixed points. This is Abbott's classification; but he calls "torsion" movement on one fixed point and "rotation" movement between two fixed points. Lance thinks that the term torsion should be restricted to movements impressed on the vertebral column, and rotation to the result of this torsion on the vertebral body.

Forbes' method is a torsion of the vertebral column on one fixed point, not made directly on the vertebræ but indirectly by the intermediary of the ribs. The result is a rotation of the vertebræ inversely from the motion compressed on the axis of the shoulders. Forbes explains the vertebral rotation action in that "the power of creating torsion by the medium of the arm seems to be transmitted to the thorax by the intermediary of the serratus magnus and the synergic muscles." Lance thinks this hypothesis is difficult to establish, as the movement of the ribs around the costal angle is not demonstrated and it is difficult to understand how the costal angle is transformed into a fixed point; moreover the serratus magnus is not the only muscle on which the traction of the arm acts. The posterior scapular muscles, the rhomboid, the grand

dorsal, and the trapezius are as much involved as the serratus magnus and their action tends to turn the vertebral body the opposite way.

Regarding the Forbes method of fixing the pelvis and turning the shoulders, causing torsion of the vertebral column, Lance's experiments show him that it is possible by rotation and inclination of the pelvis to act on the lumbar and dorsolumbar region alone. He has successfully employed this method since February, 1914, in treatment of lumbar scoliosis.

Abbott's method according to Lance may be divided into a series of actions on the vertebral column. These are: (1) an action on the shoulders similar to that of the Forbes method. It is a torsion of the column on a fixed point, but the fixed point, instead of being pelvic as in the Forbes method, is thoracic; (2) an action on the pelvis which results in rotation of the lumbar vertebræ in the same sense as the pelvis; (3) a thoracic torsion of the column between two fixed points; (4) a derotation action by the special Abbott sling; (5) a powerful sidewise action by the lateral traction bands.

The author believes that it is wrong to say that the methods of Forbes and Abbott are in opposition and that their modes of action are contrary. Both methods give varied modes of torsion of the vertebral column. The Abbott method utilizes all these principles, but the action of some naturally lessen the effect of others. Both place a series of modes at the disposal of the orthopedist and it is for him to adapt and combine them for each particular case.

The results of experiments are given and accompanied by radiographs. W. A. BRENNAN.

SURGERY OF THE NERVOUS SYSTEM

Strauss, I.: The Treatment of Sciatica. *J. Am. M. Ass.*, 1917, lxix, 2033.

The author has studied and analyzed 91 cases of sciatica. He believes that there exists a large group of cases in which the lesion, functional or organic, exists in the nerve itself. This opinion originally obtained, but recently many men have swung to the extreme view that all sciatica is but a symptom. In his cases the author could exclude definite organic lesions elsewhere.

He gives the pathology, describes the symptomatology and clinical course, and outlines with care and detail the management of sciatica and its treatment by perineurial and epidural space injections of physiologic salt solution. K. L. VEHE.

Coriat, I. H.: The Presence of Taste Fibers in the Lingual Nerve. *Dental Cosmos*, 1918, lx, 217.

Coriat observed that in 21 children between the ages of ten and sixteen years the presence of taste fibers in the lingual nerve was demonstrated. This was done by injections with local anæsthesia. Seven of these were left mandibular injections, six right mandibular injections, and eight double mandibular injections. In all these cases, on the anterior two-thirds of the tongue, either on the right or left side or on both sides, according to the nature of the mandibular injections, there was a complete loss of sensation to touch, pain, and temperature.

In every case likewise there was a complete loss of taste for sweet, sour, and salty objects over the area of the tongue where the other sensations were lacking. In each case, fifteen minutes were allowed to elapse in order that the local anæsthetic might reach its full point of intensity. In some of the observations, the anterior two-thirds of the tongue would sometimes show only a diminished sensation for touch and pain, while in this same area taste would be completely lost.

Observations such as these demonstrated that the taste fibers become blocked before the fibers for touch and pain, first, because the former are more highly differentiated, and second, because the lingual nerve must contain taste fibers; otherwise no diminution of taste sensation would have taken place over the distribution of the lingual nerve. This is in harmony with the author's observations on selective sensory regeneration, in which it was demonstrated that the fibers for light touch are regenerated later than the fibers for pain, because they are more highly specialized and differentiated. In none of the cases was taste or sensation disturbed on the posterior portion of the tongue.

In one experiment the subject was able to distinguish salt slightly, but unable to perceive sweet. This was probably due to the persistence of special neurons which subserve the function of tasting salt. There was temporary blocking of the "sweet" peripheral receptors, a sort of selective apparatus for different taste qualities, the same as the selective sensory apparatus in the skin. Frankl-Hochwart has also pointed out that there may be selective receptors for different taste qualities on the tongue, an observation that is confirmed by one of the experiments.

To summarize, as the result of isolated mandibular injections with novocaine for the extraction of teeth, which is in the nature of an exact physiological experiment, it was found that the fibers for taste in the anterior portion of the tongue pass through the lingual nerve, at least in its peripheral portion, before they join the chorda tympani.

M. N. FEDERSPIEL.

Sicard, J. A.: Painful Neuritis Resulting from Wounds of War; Treatment by Intertruncular Alcoholization of the Nerves. *Lancet*, Lond., 1918, cxciv, 213.

Paroxysmal neuralgias are present more often in certain nerves than in others, notably the median

sciatic, and more rarely, the ulnar, the crural, with the radial occasionally. In certain cases the painful condition persists, resisting all treatment, those of the median particularly having an irritable condition similar to that of trigeminal neuralgia.

The author relates his experiences in treatment of such obstinate cases, medically and surgically, and refers to the failure to give relief until intratruncular alcoholization was employed.

This method applies only to cases in which pain is restricted to the tributary peripheral nervous territory of the injured nerve. Technique is described in detail, the nerve involved being exposed under local or general anæsthesia, and one to two cubic centimeters of alcohol at 60 to 80 per cent injected at from 3 to 4 cm. above the seat of injury.

For success of this method, the injection must be made 3 to 4 cm. above the nerve lesion; all nerve trunks supplying the painful region must be injected; if there has been former surgical intervention, injection must be above the superior limit of the former operation.

The method is used only in the extreme cases.

Alcohol at 70 degrees interrupts the motor conductivity but for six to ten months, recuperation of function then occurring, since this method does not cause wallerian degeneration.

Certain cases show increased motor function immediately after injection, due possibly to greater affinity of the sensory fibers to alcohol or to the fact that excess of pain may have formerly caused inhibition of motor function.

The method is recommended in resistant cases of painful neuritis caused by gunshot wounds; and special attention is called to permanent cures effected and to the return of motor power after sensory relief.

V. E. DUDMAN.

MISCELLANEOUS

CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESSES, ETC.

Jack, W. R., and Teacher, J. H.: A Case of Metastatic Cancer of the Bone-Marrow Without Erythroblastic Reaction. *Glasgow M. J.*, 1918, vii, 81.

The authors refer to the blood picture generally accepted as being characteristic of carcinoma. This is of the chlorotic type, having a low color index and no erythroblasts, as contrasted with the picture presented when bony metastasis occurs, in which case the high color index and myelæmia, coupled with bone pains, are the chief ground for belief that such progress of pathology has occurred.

They cite a case, however, as an exception to this rule. This case gave a history suggestive of gastric carcinoma, substantiated on operation. Relief was obtained by gastro-enterostomy. After one year, emaciation and loss of weight was marked, and bone pains, sternal and vertebral, suggested bone metastasis. Blood count revealed a chlorotic type of anæmia, no erythroblastic reaction being present.

Autopsy showed a primary pyloric carcinoma, with secondary tumors in the left lung, liver, sternum, ribs, and vertebræ.

In comparing this case with former reported cases of like character in which active erythroblastic reaction was present, the authors suggest that the regenerative effort may have been less because of a smaller amount of tumor tissue in the marrow.

Another possible explanation for the lack of reaction is that some cases may be non-reactive because of their greater toxicity, analogy being drawn to the relatively shorter course of the non-reactive aplastic anæmias as compared with the relatively less toxic pernicious anæmias, in which regeneration presents for a time.

Whatever may be the explanation, the authors conclude that the blood picture in bone metastases of carcinoma, while suggestive and substantiatory, is not a necessary diagnostic feature.

V. E. DUDMAN.

Cannon, W. B., Fraser, J., and Hooper, A. N.: Some Alterations in Distribution and Character of Blood in Shock and Hæmorrhage. *J. Am. M. Ass.*, 1918, lxx, 526.

The authors report their observations in 98 cases of shock and hæmorrhage with 14 control cases. The patients were severely wounded soldiers at a casualty clearing station. The observers made routine examinations of the blood, consisting of red blood corpuscle counts, estimation of the hæmoglobin, and determination of the percentage of corpuscles in the blood. The examinations were made on capillary and venous blood. The capillary red count was found high in shock, i.e., six to seven million, much higher in proportion than the venous. The discrepancy is greater, the more profound the shock. There is evidently concentration and a stagnation of corpuscles in the capillaries. This condition is gradually recovered from in two or three days.

The capillary hæmoglobin readings exceeded the venous by amounts ranging from 6 to 29 per cent. When hæmorrhage accompanies shock, the capillary red count may be low, but bears the same higher relation to the venous. In hæmorrhage cases the red count is usually much lower than in shock alone but is not as low as the pallid appearance of the patient would indicate. In 21 such cases the average count was from 5,800,000 to 3,900,000. The venous was much lower. There was always a relatively low hæmoglobin reading, followed by a further fall in the count and hæmoglobin. After

operation attended by hæmorrhage the same condition of low hæmoglobin as compared with the red count was present. If there was no hæmorrhage the hæmoglobin and corpuscles might be higher than before operation, probably owing to loss of fluid from the body.

Both the count and hæmoglobin are raised by transfusion of blood. Injection of gum solution leads to a dilution of the blood that may persist for some hours. Intravenous administration of a large amount (2 pints) of hypertonic salt solution may markedly reduce the hæmoglobin content of the blood; half that amount has not had this effect and is safer. Injection of the salt solution reduces the capillary stasis.

As a prognostic sign, continued concentration of the capillary blood for several days is an unfavorable condition. Disappearance of the concentration indicates improvement. Continued dilution of the blood after the fourth or fifth day is ominous.

L. R. GOLDSMITH.

Polak, J. O., and Heffter, O. H.: A Clinical Study of Blood-Pressure and Hæmoglobin in Post-operative Shock, Postoperative Hæmorrhage, and Postoperative Cardiac Dilatation. *Surg., Gynec. & Obst.*, 1918, xxvi, 312.

As a result of a careful study of the blood-pressure, hæmoglobin and leucocyte count before, during, and after operation in a series of cases, Polak and Heffter draw the following conclusions:

There is a constant rise of 5 to 15 points in the hæmoglobin readings following ether anæsthesia, when the anæsthesia lasts over thirty minutes.

In the majority of cases there is a moderate fall in both the systolic and diastolic blood-pressure following ether. The blood-pressure returns to normal, i. e., pre-operative reading, in 12 to 48 hours. In cases of shock, especially where there has been much blood loss during the operation, the fall in blood-pressure is greater than after long operation without blood loss, dropping from to 10 to 50 mm.

The pulse-pressure is a better index of hæmorrhage or cardiac failure than the systolic pressure.

There is a constant rise in the leucocyte count in hæmorrhage, while the leucocytes fall in shock.

As regards operative prognosis, the systolic blood-pressure is of less consequence than the pulse-pressure. A high systolic blood-pressure is of no particular significance, providing the pulse-pressure be at least 30 mm. The only exception is the high pulse-pressure of aortic regurgitation.

LISTER TUHOLSKE.

Madigan, J. J., and Moore, T. V.: Dystrophia Adiposogenitalis; Froehlich's Syndrome; Report of a Case. *J. Am. M. Ass.*, 1918, lxx, 669.

The authors report the case of a boy presenting the cardinal symptoms of Froehlich's syndrome, dystrophia adiposogenitalis. Taking the case as an example, they discuss these symptoms, grouping them as follows, according to Cushing's scheme:

1. Neighborhood symptoms: deformation of the sella turcica, suggesting a hypophyseal tumor; optic atrophy and lateral nystagmus; nasopharyngeal discharge of clear watery fluid.

2. General pressure symptoms: no headache, vomiting, or choked disk.

3. Glandular symptoms: above the average height, suggesting hyperpituitary function, but possessing fine features; adiposity; maxillary prognathism, due to retarded mandibular development; polydipsia.

4. Symptoms referable to other glands: sexual aplasia, undescended testicles, well developed mammæ, enlarged thyroid, bronzing of the skin, and dullness suggestive of an enlarged thymus.

Reference is made to Bartels' advancement of three theories explaining the relationship of hypophyseal changes to this class of dystrophy: (1) both tumor and dystrophy may be due to inborn co-ordinate germinal dispositions; (2) hypophyseal tumors cause the dystrophy, or (3) injury to a neighboring center, rather than to the hypophysis itself, causes the dystrophy.

Cases explained by the second theory develop later in life. The case cited is explained by the first theory, as proven by (1) the hereditary taint and number of deformities in the mother's paternal relatives; and (2) the prenatal origin of the case as shown by (a) blindness from birth; (b) nystagmus at three to four months; (c) evident prenatal genital aplasia; and (d) the small optic disks.

V. E. DUDMAN.

Carter, W. W.: Status Lymphaticus; Death Following Tonsillectomy; Autopsy. *Med. Rec.*, 1918, xciii, 19.

Carter reports an unusual complication following a tonsil operation. Three hours after the operation, done under general anæsthesia, the patient, a girl five years of age, suddenly became cyanosed, and death ensued before the house surgeon could be summoned.

An autopsy was performed three hours after death, with the following findings: The thymus gland weighed 21½ grams and was enlarged, reaching over the base of the heart and blood-vessels; the foramen ovale of the heart was open; the malphigian corpuscles of the spleen were unusually prominent; and the mesenteric glands were enlarged. The retroperitoneal glands were enormously enlarged. A pathological diagnosis of status lymphaticus was made.

The author has met with only two cases of this type in his large experience and states that it is impossible to foretell the existing condition.

The thymus gland has a rich arterial supply, but the veins emerging from it constitute only a single small plexus; this disproportion between the afferent and efferent blood-vessels would seem to favor rapid engorgement of the gland, and is held by some authors to be the cause of sudden death during a violent strain.

Two views have received wide attention: (1) that there is a neurosis of some sort, toxic or otherwise, and that death is a cardiac death; (2) that there is a compression of the trachea and that death is due to strangulation.

The author believes that death in his case was cardiac.

The anæsthetic and not the operation, Carter believes, is usually the important factor in determining the fatal issue. In those cases where death is due to compression there is usually a history of gradual increasing dyspnœa extending over a period of weeks or months.

In 1904 Jackson reported a case of a child four years of age in which dyspnœa was relieved by using a long tracheotomy tube; a cure was later effected by removing the thymus gland. M. A. BERNSTEIN.

Detweiler, H. K., and Maitland, H. B.: The Localization of Streptococcus Viridans. *J. Exp. Med.*, 1918, xxvii, 37.

The authors point out that the theory of the power of selective action on the part of bacteria, with regard to the tissues in which they may localize, is by no means a new one, and it has been known for many years that the meningococcus has a predilection for the meninges, bacillus diphtheriæ for the mucous membrane of the throat, bacillus typhosus for lymphoid tissue, the pneumococcus for the lungs, and bacillus pertussis for the tracheal mucous membrane. But the idea that different strains of the same organism should possess distinct localizing power and should vary consistently in their selective action is not generally accepted, they state.

In the work here reported strains of streptococcus viridans only were used. The plan followed was to use each culture of streptococcus immediately upon isolation. The reason for this was the claim that strains of streptococci lose their special localizing power if subcultured. In some instances the strains were used as isolated and again after several subcultures had been made. It frequently happened, however, that it was impossible for some reason to try out a strain at once; in such cases the fact was indicated in the reports.

The number of rabbits used for the first inoculation was usually three, but this also was not strictly adhered to because of circumstances which the authors could not control. The organisms were obtained from many different sources and from patients suffering from a diversity of ailments, in an endeavor to make the series as comprehensive as possible.

The strains of streptococci employed in these experiments were obtained by recognized methods of bacteriological procedure. In cases of endocarditis the technique of blood culture was that described by the authors in 1916, while in the instances in which the affected valves were cultured, the tissues were treated after the manner described by Rosenow. This was also carried out in culturing appendices, gall-bladders, and other tissues. Cultures from the tonsils were obtained by expressing the cheesy material and other débris from the tonsillar crypts after swabbing the surface with sterile gauze. Extirpated tonsils were washed in sterile saline solution, then carefully opened, and material from the depths was cultured.

Abscesses at the apices of teeth were cultured in the dentist's office or at the dental clinic at the hospital. After swabbing the area of operation with 2 per cent iodine, the tooth was extracted with great care to prevent contamination, and cultures were taken from the apex. Sometimes the tooth was broken open and cultures of streptococcus viridans were obtained from the pulp. The technique in connection with cases of pyorrhœa alveolaris was simple and effective. Preparation of the area was carried out as described and a fine capillary pipette with bulb attached inserted between the tooth and the gum. The point was thrust to quite a depth and the bulb was not released until the point was at the bottom of the pocket. In these cases streptococcus viridans in pure culture resulted in nearly every instance.

Rabbits about eight to twelve weeks old were used and were inoculated intravenously in the marginal ear vein. The doses were large but not sufficient to cause immediate or very early death, except in a few instances. The average time elapsing between the date of inoculation and that of postmortem examination was three to four days. Postmortem examination was performed upon the animals immediately following their death.

The lesions which the authors observed were both gross and microscopic; ulceration of the stomach, vegetations on the endocardium, turbid fluid in the joints, and hæmorrhage on the mucous and serous surfaces being typical of the former, while the latter are discussed by the authors under three types: hæmorrhage, bacterial emboli and areas of leucocytic infiltration.

The results of their experiments did not substantiate in full the theory of the power of selective action of streptococcus viridans. A few strains showed a remarkable constancy in location and type of lesion, but these strains were greatly in the minority.

The location of the lesions in animals seemed to bear no relation to the origin of the organism or to the lesions produced by it in the patient from which the strain was obtained. Streptococcus viridans, regardless of site of origin in the patient, produced most lesions in the heart and in the joints.

GEORGE E. BEILBY.

Hirose, K.: Experiments in the Artificial Production of Amyloid. *Bull. Johns Hopkins Hosp.*, 1918, xxix, 40.

Although the explanations of the arterial hypertension that accompanies nephritis have been very unsatisfactory, the fact that amyloid disease of the kidney has been almost always without effect upon

the blood-pressure and without an accompanying hypertrophy of the heart seemed very interesting to the author.

At the suggestions of Welch and Winternitz, he undertook a series of experiments with the object of producing amyloid artificially in the kidneys of animals, in order to determine whether or not amyloid kidneys were unassociated with high blood-pressure, and to study the effects of vasoconstrictor and vasodilator influences in such animals.

The experiments failed of their object, however, inasmuch as it was found impossible to produce amyloid by any of the methods employed. Nevertheless the publication of a brief summary of the work seemed justified to Hirose because it showed that, even when the methods described by other authors were faithfully followed over long periods, amyloid failed to appear, a fact which suggested to him that its occasional development should be regarded as either accidental or due to some factor not definitely recognized.

The experiments were carried out on goats, dogs and rabbits, and the substances injected were staphylococcus and turpentine.

No conclusions concerning the chief point of the problem were reached from the present series of experiments, since no amyloid degeneration was produced, but it was shown that the artificial production of amyloid was very difficult and inconstant, even when methods were employed which had sometimes been successful. Renal lesions were produced, but it seemed to the author that the factor responsible for the prosecution of amyloid has not as yet been recognized. GEORGE E. BEILBY.

BLOOD

Henry, C. K. P.: The Surgical Treatment of Pernicious Anæmia. *Canad. M. Ass. J.*, 1918, viii, 115.

Treatment of pernicious anæmia must accomplish three things: (1) remove the source of infection; (2) make up for the lost blood by (a) transfusion of whole blood, (b) stimulation of the blood-forming organs; and (3) stop hæmolysis.

It has been found that the presence of the spleen in the body is not necessary to the well-being of the individual. Experimentally and from pathological and bacteriological studies splenectomy is a rational treatment for pernicious anæmia. It is indicated in patients under fifty years of age, when less than one year ill, with a relatively good blood picture, and especially where the spleen is enlarged and hæmolysis acute. Splenectomy is not to be done during an acute crisis, or in a period where the patient shows a steady decrease in hæmoglobin and red cells, or mental torpor. It should be done before spinal cord changes occur. Striking improvement occurs following operation in almost all cases. Patients with an enlarged spleen do best.

It is best to perform the operation four to ten days after transfusion, when platelets and reticulated cells are increased. It is wise to transfuse 500 ccm. of whole blood on the table at the close of the operation. Where the hæmoglobin is 25 per cent or lower, preliminary blood transfusion should always be done.

The transfusion of blood is necessarily an adjunct of treatment, and in treating pernicious anæmia one must be prepared to carry out multiple transfusions. The introduction of whole blood immediately makes up for blood loss. The red cells are living and last for two to twenty-one days. There is an immediate improvement in appearance and well-being of the patient. The hæmoglobin increases 10 to 20 per cent, the red cell count goes up 500,000 to 1,000,000, and appetite and digestion improve. It stimulates the bone-marrow; nucleated red cells appear in the blood. Transfusion does not make new the worn-out organs, but helps tide over their period of repair and gives a stimulus to new growth. It prolongs the periods of remission and often initiates a remission. It increases resisting power, lowers temperature and prepares for splenectomy.

It is now generally expected that splenectomy (1) initiates in a large percentage of cases a prompt remission, lasting six months usually, rarely one year; (2) that it is the best and most lasting stimulus available for the blood-forming organs; (3) that it does more for the patient than single or repeated blood transfusions; (4) that it prolongs life.

Henry concludes as follows:

Pernicious anæmia continues to be a fatal disease. Under ordinary medical treatment the duration of life is shorter than under transfusion and splenectomy. Cases do best who come earliest under this treatment.

The treatment must be systematic and carried out by one who is able to provide suitable donors, and to carry out the necessary blood tests for obtaining these donors.

Splenectomy should be done at a suitable time, properly prepared for, and followed by transfusion from time to time.

All foci of infection must be looked for and removed. The operator must be ready to do an appendectomy and cholecystectomy at the time of operation for the removal of the spleen.

ALBERT EHRENFRIED.

Fraser, J., and Cowell, E. M.: A Clinical Study of Blood-Pressure in Wound Conditions. *J. Am. M. Ass.*, 1918, lxx, 520.

The authors have conducted investigations for a period of two years on the relationship of blood-pressure to various wound conditions. The work was done in a casualty clearing station a few miles from the front line. Of the instruments employed the mercury manometer gave the most accurate reading of the systolic pressure, while the spring instrument, though not so accurate from a mechanical point of view as the mercury column, gave a more easily appreciable reading of the diastolic pressure. Healthy soldiers were used as controls.

The average systolic pressure in a wide series of cases was 110 to 120, and the diastolic from 70 to 80, while the pulse-pressure averaged 40 mm. The systolic pressure was somewhat higher among soldiers engaged in actual fighting than among those who were occasionally exposed to fire. The raised pressure quickly dropped when the soldier was resting away from the firing line. The average systolic pressure in aeroplane pilots after a two hours' bombing raid remained constant at 135 mm.

Pressure reading taken shortly after the patient had been wounded can be classified into two distinct groups: (1) the hypertension group, in which the systolic pressure varies from 150 to 160 or even 170 mm.; (2) the hypotension group with primary shock, in which the pressure varies from 40 to 90 mm. In this first examination there were practically none showing a normal pressure. Following treatment the blood-pressure may become partially reestablished.

In scalp wounds there is no appreciable alteration in the blood-pressure. Compound fracture of the skull with dura intact shows a relatively high pressure, averaging above 140 mm. Penetrating wounds of the skull with free drainage are generally associated with a low blood-pressure. In wounds of the ventricles the pressure is from 130 to 170 mm. In superficial wounds the pressure is low. Wounds of the head are accompanied by unstable blood-pressure. If at all possible operation on the head should not be undertaken until the pressure becomes stable. General anæsthesia increases the danger.

In abdominal wounds the blood-pressure was found to be low, i.e., 50 to 100 mm., in patients seen within six hours after an intraperitoneal injury of a hollow viscus. With the application of warmth, rest, and morphine the primary shock passes off and pressure rises. If sepsis or great loss of blood produces secondary shock, the pressure falls again. In perforating wounds of solid viscera the systolic reading is from 130 to 140 mm., even in cases accompanied by considerable hæmorrhage. In extraperitoneal wounds of the viscera the pressure is practically normal. Large wounds of the parietes are generally associated with a lower blood-pressure than small wounds, even if there is less visceral destruction in the former. When the peritoneal cavity is opened and blood allowed to escape, the pressure falls rapidly; if, however, the abdominal cavity does not contain much blood, its opening is followed by a rise of about 20 mm. After ten minutes there is again a slight fall.

Large open chest wounds are accompanied by a profound fall of blood-pressure. Uncomplicated closed wounds have normal pressure. Hypotension is present with severe hæmorrhage or severe exposure to cold or infection. Compound fractures of extremities are associated with low pressure, especially marked in fractures around the knee-joint. In face wounds there is no alteration, unless lowered in compound fracture of bones. Multiple wounds of the body and extremities cause a fall in blood-pressure.

As to treatment of shock, the best results, even in the severest cases accompanied by hæmorrhage were obtained by direct blood transfusion. Injections of calcium hypertonic gum solution will produce an immediate rise of pressure in hæmorrhage cases or cases of hypotension complicated by toxæmia. This may tide the patient through an operation. Infusion with hypertonic saline is useful in milder cases of shock and hæmorrhage. Results obtained after infusion with physiologic sodium chloride solution have been unsatisfactory.

As an aid to treatment and prognosis a steadily rising or maintained high pressure is a favorable prognostic sign. Sudden fall may indicate onset of gas gangrene or sepsis.

Reports of illustrative cases with charts accompany the interesting observations.

L. R. GOLDSMITH.

Hédon, E.: Transfusion of Citrated Blood (Sur la transfusion du sang citraté). *Presse méd.*, Par., 1918, xxvi, 57.

Hédon gives the priority of making transfusions of citrated blood to Agote of Buenos Aires in 1914. The method was almost simultaneously practised by Lewisohn of New York and Hustin of Brussels. Hédon's own researches were made independently at the instigation of Jeanbrau.

Recent experiments on animals have shown Hédon that transfusion of citrated blood increases the coagulability of the whole blood in a transfused dog. Although the question still remains under investigation, there appears to be no danger that an injection of citrated blood will diminish a patient's coagulability and expose him to the danger of secondary hæmorrhage.

W. A. BRENNAN.

BLOOD AND LYMPH VESSELS

Neuhof, H.: Fascia Transplantation into Lateral Defects of the Major Arteries. *Surg., Gynec. & Obst.*, 1918, xxvi, 324.

Neuhof proposes to demonstrate that fascia is as serviceable as vessel-wall or peritoneum-muscle for the replacement of lateral defects of the major arteries, and at the same time offers greater possibilities for application to human surgery.

In patching an arterial defect with a section of artery or vein or peritoneum-muscle, accurate apposition of intima of vessel to intima or peritoneum of transplant, avoidance of trauma to the inner lining of the transplant, use of special suture material, etc., are essential. Theoretically, a simple, strong, connective tissue such as fascia could be used without fear of damaging a delicate intima and without the necessity of accurate apposition of layers. Also the chance for the success of a fascial graft appears inherently greater than those of more highly differentiated tissues. Finally, it has been shown that defects of other hollow viscera can

be adequately replaced by fascia with regeneration of the lining membrane.

Surgical conditions involving the use of such transplants are usually emergencies encountered by the general and not the specially skilled blood-vessel surgeon. Autotransplants of segments of artery are not obtainable in human surgery. Vein grafts are more feasible, but suitable ones are obtained with some difficulty. Peritoneum-muscle transplants can be legitimately applied only to the repairing of defects of intra-abdominal vessels. Fascia, however, is accessible in the neighborhood of almost every operative wound. The fascia lata is the most desirable and it may be obtained readily and quickly in unlimited quantity.

The author performed seven experimental operations on dogs, of which four were followed from six to nine months. Except for one case which was complicated by hæmorrhage, and one with thrombosis, the results were satisfactory anatomically, functionally and histologically.

Rubber covered artery clamps shut off the artery above and below the lateral defect; branches of the artery located between the clamps are ligated or temporarily clamped. Blood in the interior of the vessel is washed away and a gauze sponge freely spread with vaseline is placed over the exposed lumen. A section of fascia lata of the desired shape and of slightly larger size is removed, dipped in vaseline and immediately placed over the arterial defect, with its smooth surface facing the lumen. It is fixed in place by four sutures, and a continuous suture approximating the edge of the fascia to the cut edge of the artery is made between them. Compressing the patch lightly with a piece of vaselined gauze, the lower and then the upper clamp on the artery is removed. If there is oozing from gaps between individual stitches, reinforcing ones are passed from the margin of the transplant to the adjoining arterial wall at those places.

ALBERT EHRENFRIED.

Burrows, H.: Paralysis Following Arterial Injuries. *Brit. M. J.*, 1918, i, 199.

Extensive paralytic phenomena may follow a vascular lesion independent of any direct traumatism of peripheral nerves. The main symptoms are subjective sensations in the distal part of the affected limbs, anæsthesia more or less of "stocking" or "glove" type, muscular paralysis, hardness of muscles, and œdema. The subjective sensations were referred to as "pins and needles." Motor paralysis was present in all of 10 illustrative cases.

In seven of the cases considered to be ischæmic in nature there was obliterative injury of the distal pulse, subjective sensation of "pins and needles," muscular paralysis and anæsthesia of the stocking or glove distribution. In three the paralysis gave the impression of being less organic and was termed reflex paralysis. In these cases there was arterial injury without complete paralysis, absence of "pins and needles" sensation, flaccid paralyses of muscles and widespread loss of cutaneous sensibility, extending in two instances well above the level of the wound.

The electrical reactions of the affected muscles have not been studied. Prognosis and possibility of resultant deformity is not known. Until more is known about these cases one should be reluctant to tie a main vessel to stop bleeding. An attempt should be made to find a possible bleeding branch or if the injury is to the main trunk, suture should be considered. Where it is imperative to tie the artery, the vein should be tied with it.

C. A. HEDBLOM.

POISONS

Wright, A. E., and Fleming, A.: Acidæmia Gas Gangrene, and the Conditions Which Favor the Growth of Its Infective Agent in the Blood Fluids. *Lancet*, Lond., 1918, cxciv, 205.

In connection with gas gangrene one of the authors has shown that: (1) the bacillus of Welch when cultivated in serum renders that medium acid; (2) the normal blood fluids by virtue of their alkalinity and antitryptic power antagonize the growth of the bacillus; (3) the blood fluids become a more favorable culture medium for the organism when their alkalinity is blunted by acid, or their antitryptic power by trypsin, and more conspicuously when both are done; (4) the septicæmic gas infection which develops in animals is associated with the development of the postmortem acidosis; (5) in the living animal the evolution of gas gangrene goes hand in hand with a local and general acidosis; (6) in man the characteristic toxæmia of gas gangrene is correlated with the supervention of a very severe acidosis; and (7) an immediate improvement of the patient follows the intravenous injection of alkali.

In a table the authors show that in the toxæmia of gas gangrene there is a very pronounced acid intoxication. All of the gas gangrene microbes, with the possible exception of bacillus fallax, when they grow freely make the serum acid. Those of inferior rank grow with difficulty in normal serum and grow better and better as the serum alkalinity is blunted off.

There seems to be no special predisposition of wounded muscle to gas gangrene infection due to its carbohydrate content, for Hulz has shown that severe muscular exercise uses up every trace of glycogen in the body; consequently in men wounded during intense fatigue of battle, it cannot be taken for granted that their muscles contain glycogen. However, functioning and devitalized muscle elaborates carbonic and lactic acid; therefore in a muscle fatigued or cut off from its blood supply by trauma, tourniquet, ligature, etc., a local reduction of alkalinity occurs which would be favorable to the development of the gas-gangrene bacillus. Experimentally glucose was added to serum; it does not exert upon the growth of the bacillus of Welch any constant or marked favorable influence.

In a large majority of the cases of gas gangrene there was well-marked hyperpnœa and in some cases quite classical air hunger and the picture of acidosis. There is a disposition to serous effusion into the tissues.

The constitutional treatment of the acidæmia of gas gangrene toxæmia has been that of grave diabetic acidosis; an intravenous injection of alkali, followed by lactate of soda by mouth in four doses hourly of 8 grains until the urine becomes alkaline. Five per cent solution of $NaHCO_3$ has been employed intravenously. As an anæsthetic for the operation chloroform must be avoided; warm ether gives much better results, and nitrous oxide with oxygen is far the best anæsthetic. Locally 5 per cent salt solution is applied to the wound.

The authors state that by the early administration of alkali the acidæmia may be forestalled and an obstacle placed in the way of the growth of the infective agent. V. C. HUNT.

D'Agata, G.: A Case of Mycosis Due to a New Species of Oospora (Su un caso di micosi, dovuto ad una nuova specie di oospora). *Policlin.*, Roma, 1918, xxv, *sez. chir.*, 81.

The author describes a tumor on the right cheek of a woman from which an organism histologically proved to be a new species of oospora was cultivated and found to produce similar lesions when inoculated into the peritoneal cavity of a guinea-pig.

The author thinks the case of interest to surgeons and pathologists, as it directs attention to the etiology of certain infective processes of granulomatous type produced by organisms of the family mucedineæ which simulate syphilitic or tuberculous lesions.

The new species of oospora is named after D'Agata. W. A. BRENNAN.

ROENTGENOLOGY

Lapham, M. E.: Tuberculosis and X-Ray Plates. *N. Y. M. J.*, 1918, cvii, 294.

Lapham, writing of pulmonary tuberculosis in children, states that the diagnostic value of the X-ray is diminished by the frequency with which structural changes are found in apparently well children. Positive tuberculin reactions and tuberculous lesions at autopsy, neither preceded by a trace of clinical tuberculosis, are commonly found. These three proofs that tuberculous processes are common, not necessarily associated with the disease called tuberculosis or inimical to health, show about the same percentage of occurrence. Is it possible that these structural changes as seen in X-ray plates, in cases not regarded as tuberculous, are in the nature of living autopsies revealing the same truths as do the tuberculin test and the autopsy?

Beginning with enlarged bronchial glands, then thready infiltrations from the root toward the apex, in successive stages the glands become larger, the infiltrations more massive; then mottling and nodules are seen and finally the picture typical of undoubted tuberculosis is present. One gains the impression that these changes are permanent and that their development requires time; that tuberculous processes begin in the bronchial glands of children and persist indefinitely. If this is true, then the diagnosis of tuberculosis as a disease depends not so much upon the detection of structural changes in the lungs as upon the recognition or estimation of the effects of these changes upon the health. If it is true that all cases of tuberculosis pass through a period of indefinite duration during which there are no clinical signs recognized as warranting a diagnosis, then the standard of diagnosis for manifest cases will not be suited to the estimation of latent ones. One must be thoroughly informed of the first effects of latent tuberculosis or he will be forced to wait for manifestation. If the first effects are seen in disturbances of the vegetative nervous system and ductless glands, then one should be able to detect these disturbances. If every system in the body is likely to go astray on account of a fundamental fault, then the recognition that this fault is caused by tuberculous processes is important. It seems probable that children's diseases cannot be understood until it is possible to determine whether a disorder in any system is primary or whether it is symptomatic and secondary to tuberculous processes.

Following a detailed report of four cases of ill health, finally presumed to result from latent tuberculosis, the author gives the result of the X-ray study of the lungs in 150 children, 100 being from Highlands and 50 from Atlanta, and all supposedly normal. Twenty-two per cent of the Highlands cases and seventeen per cent of the Atlanta cases did not show sufficient gland enlargement or lung infiltration to deserve the name of structural change.

Lapham's conclusions are, partially, that a research study of the relationship of the perversions of function in the vegetative nervous system and the ductless glands to occult tuberculous toxæmias is needed before deviations from health can be recognized which may represent a tuberculous etiology. This knowledge is especially important since many functional diseases of childhood are symptomatic manifestations of these toxæmias. The best prevention of tuberculosis consists in the earliest possible recognition of the deviations from health caused by the assumption of pathological processes commonly present in the lungs and bronchial glands and usually harmless. DAVID R. BOWEN.

Hamburger, W. W.: Roentgenological Studies in the Healing of Gastric and Duodenal Ulcer. *Am. J. M. Sc.*, 1918, clv, 204.

The author sets forth the following conclusions:

1. A method of roentgenological study of the healing of gastric and duodenal ulcer is described. This method consists of repeated roentgenological studies of ulcer patients before, during, and at

varying intervals after the institution of medical treatment.

2. This method is of value in the diagnosis, prognosis, control of medical treatment, and selection for surgical treatment of gastric and duodenal ulcer.

3. The method is of value in studying the pathology of the healing process in both clinical and experimental ulcer. Thus far it is not of positive value in the differential diagnosis between ulcer and cancer, although in the future it may shed some light on the much discussed problem of the frequency of malignant degeneration of callous ulcer.

4. In the use of the method, the danger of mistaking normal peristalsis for penetrating ulcer and of the overlooking of the presence of small ulcer because of incomplete or insufficient examination must be borne in mind.

5. These results are presented only as a preliminary report for the purpose of stimulating work by other men along similar lines. It is in no sense to be construed as the final word on the subject, for each new case, as it is studied, brings its own message and suggests new viewpoints and problems to be interpreted, thus amplifying and possibly negativing the conclusions reached in the preceding cases.

MILITARY SURGERY

Bertein, P., and Nimier, A.: Early Treatment of War Wounds (Premières heures du blessé de guerre). Masson et Cie, Paris, 1918.

In the enormous medical literature of the war, scarcely any attention has been paid to the medical service of the front line. The technical rôle of the regimental medical officer and the conditions under which he can perform his perilous task to the best advantage is well set forth in this book, written by two young surgeons who have lived from day to day in the trenches, in the precarious shelter of the dressing station. They offer many valuable suggestions whereby the efficiency of the first treatment of the wounded can be increased.

A bird's-eye view is given of modern warfare, with the peculiarities which distinguish it from the struggles of former times, requiring consequent modifications in the organization and functions of the sanitary service. These functions vary according to the phases of the battle. In the phase which the authors term *tonic*, and which may be prolonged over several months, the losses are at a minimum, and the rôle of the sanitary service is relatively simple at times when offensive actions are suspended. But in the *clonic* periods, on account of the enormous number of troops brought into action, and of the strength of the armament, the losses rise, in attacks and counter-attacks, to the highest figures that can be found in the most bloody battles of former times. The task then imposed on the sanitary service is enormous and difficult.

Aside from bullet wounds with punctiform openings, practically all wounds are contaminated. Shell wounds are particularly grave on account of destruction of the tissues, entrance of infected foreign matter gathered during the flight of the missile and retention of the shell fragment itself in the tissues. These facts demand an urgent and energetic treatment and make clear the obligation on the part of the regimental medical officer to send back the wounded man as soon as possible to the point where disinfection of the wound will be carried out, after dressing and immobilization of the traumatized parts.

The duties of the sanitary service during action may be summarized as follows:

1. To rescue the wounded man as early as possible and carry him to a place of security.

2. If the patient can be transported, to see that he is quickly evacuated to a sanitary formation farther back, after dressing and immobilization of the wounded parts.

3. To maintain and give necessary attention for a few hours in a sufficiently equipped dressing station to the severely wounded who are shocked or untransportable.

4. To carry out proper treatment of hæmorrhage and visceral lesions for which intervention is extremely urgent.

The organization for picking up or rescuing the wounded differs according to whether it occurs during stable trench warfare or in the open field during attacks.

Salvage of the wounded during stable trench warfare usually presents little difficulty or special danger. The chief question requiring discussion is that of the passage of litters along the communication trenches. There is an evident incompatibility between the litter, a rigid, long and cumbersome appliance, and the trench, which is a narrow tortuous passage with sharp angles, lying deeply between the two high walls which are indispensable for security.

The litter should be comfortable for the wounded man; light, so that its own weight, added to that of the patient, does not make an excessive load for the bearers; strong, so that during the journey no breakdown will occur; as small as possible, so that it can pass freely along the narrow passages and enter the small openings of the dugouts. It should finally, and this is a *sine qua non* for a litter to be really effective, be adaptable to either hand, wheelbarrow, or automobile transport, and also be capable of being placed on the ground without modifying the position of the patient or imposing new sufferings on him.

Of all models of litters in present use or those that have been suggested, the authors consider that the

regulation folding stretcher most nearly approaches these requirements, but does not meet the conditions entirely. The regulation litter was designed for mobile warfare, for rescue in the open field, and is quite unadapted to the present form of trench warfare, in which the wounded are evacuated through narrow passages in which the bearers are compelled in order to pass certain angles either to raise the stretcher at arms' length above the parapet, thus exposing the patient to the fire of the enemy, or to subject it to variable inclinations which are extremely painful to the wounded man and tiring to the bearers; or finally to slightly reduce the width of the litter by bending the metal hinge separating the two shafts, thus causing great discomfort.

The authors have devised a litter intended to facilitate the transport of wounded through the trenches, in which the patient assumes a semi-reclining position somewhat resembling the Fowler position or that of a man in a sitz bath. This litter is short, can be allowed to rest on the ground without changing the position of the patient, and the shafts can be fixed at two different widths, allowing the litter to be carried either on the shoulders or at arms' length. The best solution of the problem of transport of the wounded through communication trenches would be to have reserved for this purpose a special passage slightly widened and rounded at the angles, or in cases of very sharp angles, diverticulæ could be made to facilitate the negotiation of these corners by the litter.

The salvage of wounded in the open field during attacks is a very complicated and perilous operation, presenting a series of difficulties: some depending on the fact that the wounded, the medical officers and the stretcher bearers are exposed to the fire of the enemy, others upon the nature of the ground to be traversed and the distance to be covered, and at times upon the considerable number of wounded to be transported. The rescue of the wounded soldier is carried out under the menace of either artillery or rifle fire, or both at once. Artillery fire rarely hinders rescue during the day; in fact, this is safer than at night, as the bearers are able to keep better informed as to the zone bombarded by the enemy. In addition, irregularities of the ground can be taken advantage of, the entrance to the trench is more easily found, short cuts may be chosen, swampy or torn-up ground or other obstacles may be avoided. Infantry fire on the contrary renders rescue during the day almost totally impossible in open territory at less than twelve hundred to fifteen hundred meters from the enemy lines. Infantry fire is direct, while artillery fire is indirect, shelling an unseen zone, which affords only a certain number of chances of being hit to those passing through it.

In view of these facts, as far as possible the rescue of wounded in regions exposed to rifle fire should take place during the night, and that of wounded in regions exposed only to artillery fire in broad daylight. When large numbers of wounded are involved, each patient should not be transported separately to the often distant dressing station, but these men should be grouped as quickly as possible in a nearby shelter so that only after all the wounded are assembled and protected from a new injury and from exposure will they be methodically conducted to the dressing station which perhaps by this time will be relieved of the walking cases arriving there first.

This method of dividing the salvage into two distinct operations requires, if properly carried out, a much greater number of litters than ordinarily provided. It is of the utmost importance that the disturbing of the severely wounded be reduced to a minimum; the patient, once placed on a stretcher, should only be removed from it to be placed on the operating table or in a hospital bed, and sufficient provision should be previously made so that this can be carried out.

Regarding first care on the field of battle, in addition to picking up the wounded, the sanitary service of the first line has a therapeutic function to perform, limited almost exclusively, however, to arrest of hæmorrhage. This must often be carried out by the apparently brutal constriction afforded by a belt, strap, shoe-lace, or bandage, when the classical tourniquet is not available. The immediate application of this temporary hæmostasis is many times absolutely necessary to save the life of the patient until he can be given proper care at the dressing station.

Another less urgent therapeutic indication is immobilization of fractures. All the classical treatises on war surgery describe improvised immobilization apparatus, but all are too complicated to be employed on the battlefield. The authors believe that for this purpose the most simple immobilization for fractures of the upper limb consists in fixing it to the thorax with a few turns of a bandage. In fractures of the lower limb, immobilization is accomplished by using its fellow of the opposite side as a splint. When the two lower limbs are fractured, a temporary splint may be improvised with a rifle or stake placed between the two limbs and fixed to them. In addition to these essential indications, it is advisable before transportation of the wounded man to apply a temporary dressing. While this from a practical standpoint may have no real therapeutic value, it has a moral effect as an indication of the interest taken in the suffering of the patient. Of more value is an injection of morphine or ether or a swallow of tea to lessen the pain, to stimulate the patient, and to decrease the waste of nerve force.

The authors next consider the organization of dressing stations. There exist usually in each sector a series of aid stations placed one behind the other, commencing with the battalion aid station very close to the front line. Further back is found the central regimental dressing station, and still farther to the rear the division dressing station. The

regimental aid station, two hundred to five hundred meters behind the line, is only a primary shelter for the wounded, where one or two surgeons are to be found to offer urgent attention to the wounded. The infantry regiment, having three battalions, two on the front line and one in reserve, usually has three dressing stations, one for each battalion in line and the third serving as the central dressing station, the latter being the most important.

This station should be placed in an accessible spot, at the same time sufficiently distant from the front to place it out of danger in case of fluctuation of the line or of surprise attacks. It should be near the main road between the front and the rear. The dressing station should be protected from shelling, in a dugout, a deep sap, or a natural cave. Its approaches should be studied so as to facilitate the entrance and exit of litters, steep steps and crooked passages being avoided. The approaches should be carefully guarded from the view of the enemy.

Two openings should be provided, one for entrance and one for exit, for ventilation, to aid the more rapid movement of the wounded, and also to permit escape in case one of the openings should be closed by bombardment. In some cases it may be possible to have the walls boarded and a plank floor. It is advisable to have the station divided into two compartments connected by a passage. One of these may be used as a dressing room and the other as a waiting room for the wounded. These central dressing stations should be capable of holding twenty to thirty patients, with facilities for keeping the more serious cases for several hours.

The question of necessary supplies for these dressing stations is discussed in detail, including litters, blankets, clothing, dressings, splints, instruments, antitetanic serum, drugs, water and food. The personnel comprises two surgeons, two non-commissioned officers, and six men at the outside, working in two shifts.

Repetition of dressings at the different stations through which the wounded pass must be avoided. Each new dressing means new suffering, diminishing the resistance of the patient, increases the shock, and aggravates the prognosis of the wound. The necessarily dirty dressing applied in the trench by a comrade must not be followed by a mediocre dressing at the advanced dressing station, and then by a passably clean one at the central station and perhaps even a fourth of the same kind at the divisional dressing station, all this before the patient receives the only truly useful dressing, that which is performed by the surgeon after disinfection of the wound.

The principal function of the dressing station is to evacuate the patient as early as possible in the direction of the operating room. There should be no attempt at diagnosis when this is not immediately evident on superficial examination. It is important to see that the station does not become overcrowded. The aids should see that there is plenty of hot tea, and attend to the injections of antitetanic serum. Each patient leaving the dressing station is provided with a card, briefly stating what has been done for him, particularly as regards application of a tourniquet or injection of antitetanic serum.

The treatment of the wounded in the dressing station is considered under the following headings: (1) infection; (2) shock; (3) hæmorrhage; (4) fracture of the limbs; (5) wounds of the thorax; (6) wounds of the skull; (7) wounds of the abdomen.

1. *Infection.* It is important to note that there is a free interval of from nine to twelve hours after soiling of the wound by the projectile before infection develops, therefore the patient should whenever possible have his wound disinfected before this time elapses. This is the task of the field hospital, and the duty of the regimental medical officer is to make every disposition for sending back his wounded to the surgical field hospital as quickly as possible. As to the dressing applied to the wound at the regimental dressing station, the usual superficial application of tincture of iodine is useless. Good results have been seen from the insufflation into the deepest parts of the wound of the antiseptic powder suggested by Vincent, consisting of a mixture of ten parts of calcium hypochlorite and nine parts of powdered boric acid. The insufflator is provided with a long glass cannula introduced into the wound. The dressing over the wound should be abundant and firmly applied, for the principle of immobilization of wounds of the soft tissues is as important as in fractures. Injection of antitetanic serum should be obligatory.

2. *Shock.* This should be distinguished from collapse due to hæmorrhage, because the latter demands local treatment in addition to general. The two capital symptoms to be combated are chilling and hypotension. For increasing body temperature the limbs of the patient are to be covered with cotton wadding, and surrounded with hot water bottles. A hot air appliance of simple construction is available, consisting of a lamp with a conical cover from which the hot air is conducted under the blanket of the patient through a simple stove pipe. To raise arterial pressure the patient is placed with the feet raised, an injection of camphorated oil is given every two hours, and normal saline solution administered subcutaneously or intravenously. These patients suffering from shock, with the exception of those with abdominal wounds which should be immediately evacuated, should be kept if circumstances permit, until the arterial pressure and the general condition recovers, usually within twelve to twenty-four hours.

3. *Hæmorrhage.* The regimental surgeon should never release the patient until hæmostasis has been achieved. Hæmorrhage in jets from wounds of large vessels is rarely seen, because the patient dies before help can reach him. Sometimes spontaneous hæmostasis is observed, or bleeding from a large vessel may occur subcutaneously, producing a hæmatoma. The form of hæmorrhage most com-

monly observed is a general oozing. The differentiation of hæmorrhage from shock is of little practical importance because the treatment is the same with the addition of local control of the bleeding. In the treatment of hæmorrhage in the front line, the use of the tourniquet is too frequent; it should only be employed in default of other measures for hæmorrhage in jets. The tourniquet should never be applied without interposition of a compression pad such as a rolled bandage over the vascular tract. The omission of this compressor is dangerous, the equal constriction about all the circumference of application arresting the circulation of the limb, not only as regards the bleeding vessel, but compressing the others also. This ischæmia renders the limb an easy prey to anaerobic bacteria growing in the wound, leading to gangrene. If a tourniquet has been applied, this fact should be noted on the evacuation card of the patient. Whenever possible, the tourniquet should be discarded in favor of direct hæmostasis by forceps, either left *in situ* or replaced with ligatures. Oozing hæmorrhage should never be controlled with the tourniquet. It can be controlled by direct pressure with gauze packing.

4. *Fractures of the limbs.* Immobilization has for its objects the avoidance of injury of the neighboring nerves and blood-vessels by sharp edges of bone, the prevention of undue suffering of the patient, and the retarding of infection at the site of fracture. To accomplish these ends, immobilization must be firm and must include the articulations above and below. The authors consider the most suitable material for making splints to be ordinary green blind. This is easily transported in rolls, can be cut to convenient sizes, and readily accommodates itself to the shape of the limb. In fracture of the upper part of the humerus, simple fixation of the entire limb to the chest with a bandage is all that is necessary. In fracture of the thigh, the sound limb serves as a splint, the two limbs being then immobilized to the litter by the girths of the latter.

5. *Wounds of the thorax.* Only those with serious symptoms require special treatment at the dressing station. In ordinary cases all that is necessary is to send the patient on his way to the field hospital after immobilization of the chest as far as possible with a firm bandage, raising this part of the body by placing a folded blanket under the shoulders, and diminishing the tendency to coughing and hæmoptysis by an injection of morphine and emetine. In the case of large open wounds of the thorax, the opening should be closed by a tight gauze packing in the form of a "shirt button." These patients are only evacuated after improvement of the respiration and circulation.

6. *Wounds of the skull.* No attempt at diagnosis of these injuries should be made at the dressing station. Treatment should be confined to cleansing of the scalp, shaving the hair around the wound, application of a simple flat dressing, and evacuation to the field hospital as soon as possible.

7. *Wounds of the abdomen.* Patients with abdominal wounds should be evacuated as quickly as possible, even shock not being a contra-indication on account of the impossibility of distinguishing it from intraperitoneal hæmorrhage for which early intervention is the only chance of safety. The consensus of opinion at present is in favor of early intervention in all cases of abdominal wounds. The exigences of war however do not permit the organization of specially equipped stations in which to uniformly carry out these operations near the front line. At the present time circumstances do not allow special discrimination in favor of abdominal wounds except in isolated instances. The best that can be done is to get back the wounded as quickly as possible for hospital treatment.

In conclusion, the authors point out the defects of the present system of organization of eht medical service based on the regimental unit. At present, a regiment goes up into the line, taking with it all its medical personnel which, officers and men, replace those of the regiment relieved. The new medical personnel brings with it its supplies, the personnel retiring takes its supplies away, never exchanging. Thus every week or two weeks there is a complete change of organization; there is no chance to properly fit up the dressing stations nor learn the best and safest routes for transportation of the wounded. As a remedy for this condition, it is suggested that the medical service of the front line should be divided into two distinct parts.

1. The medical service of the regiment itself, moving with the regiment and confining its duties to those exclusive of the care of the wounded. The personnel of this service could be much reduced.

2. The service for the wounded, which would be independent of the regiment but belonging to the sector and under the direction of the Chief Surgeon.

The Chief Surgeon should have charge of the division of the sector into zones, the formation of groups of stretcher bearers, the selection of stations for these, the routes which they must take to convey the wounded to the dressing station, and finally the creation of dressing stations under good conditions. In this manner the rescue of the wounded would be quicker, more methodical, less dangerous, being carried out by a personnel knowing the sector. With the installation of dressing stations worthy of the name, with more surgical facilities, the wounded would receive early and efficient care.

These surgical posts ought to assure: aseptic dressing of all wounds; correct immobilization of fractures; rest and treatment of shocked patients; operative arrest of hæmorrhage by packing, or exceptionally ligature of a large vessel; packing or suture of open chest wounds; amputation; tracheotomy. Indications for this latter operation are very rare, being confined perhaps to fractures of the jaw with descent of the tongue into the pharynx. These cases however are more readily and safely treated by drawing out the tongue and fixing it with a ligature. The anæsthetic of choice for first line work is ethyl chloride. R. H. Ivy.

GYNECOLOGY

UTERUS

Curtis, A. H.: A Combined Bacteriological and Histological Study of the Endometrium in Health and in Disease. *Surg., Gynec. & Obst.*, 1918, xxvi, 178.

After exhaustively reviewing the literature pertaining to chronic endometritis, including physiological, pathological and bacteriological studies, Curtis details his reports and presents his views upon the bacteriology and histology of the endometrium from 118 uteri removed by operation.

He considers four classes of cases: (1) nulliparæ without history or gross evidence of infection; (2) nulliparæ with history or gross evidence of infection; (3) parous women without history or gross evidence of infection; (4) parous women with history or gross evidence of infection. Of the 118 uteri studied there were 101 endometria that showed no growth of bacteria, while there was a growth, either in pure or in mixed culture, in the remaining 17.

The comparative bacteriology and histology of the endometrium is very compactly shown by a table, from which it may be seen that bacteria are very rarely found unless there is also an infiltration with polynuclear leucocytes, plasma and round cells. Many times one of these cellular elements is present when no bacteria are present, but the combination of all three elements is rare.

But, the author remarks, it must be admitted that future improvements in cultural methods may yield bacteria from endometria with only mononuclear cell infiltration.

From this study the author draws the following conclusions:

1. The endometrium of nulliparæ without history or gross evidence of pelvic infection is almost invariably free from bacteria and is also microscopically normal.

2. Almost all women who have undergone normal pregnancy, with pelvic history otherwise negative, likewise possess bacteria-free endometria.

3. Patients with a history of chronic infection, from whose endometrium bacteria are obtainable, almost all have salpingitis with equally good growth. Chronic endometrits, *per se*, with bacteria present in smears or cultures, is practically to be ruled out as a clinical entity.

4. The gonococcus is the organism most commonly found in the uterus. Streptococci and diplococci are less common. The latter appear to live longer in the tissues than the gonococci and can apparently be isolated long after all infection seems to have disappeared.

5. Bacteria have seldom been found unless there is infiltration with polynuclear leucocytes in addition to plasma and round cells.

6. It is a wise precaution to sterilize the cervical canal by iodine, as far as it is patulous, before any attempt is made to pass instruments into the uterine cavity. Bacteria are often present in the endometrium following curettage by the technique commonly employed.

7. It would seem desirable, other conditions being equal, to operate immediately at the close of menstruation, for at this time there exists a polynuclear leucocytosis, which, to some extent, at least, aids the convalescence.

8. At the time of hysterectomy or of subtotal hysterectomy, if the tubes and other pelvic viscera are healthy, spread of infection from the endometrium need not be feared, the only exceptions being the presence of pyometra or recent exploration of the uterus.

9. Intra-uterine therapy is of little avail, for the most important focus of infection is well beyond its reach. In the cervix there are many glands that harbor infection, and it is against discharges from the cervix that treatment can be efficiently directed.

HARVEY B. MATTHEWS.

Sampson, J. A.: The Escape of Foreign Material from the Uterine Veins. *Tr. Am. Gynec. Soc.*, Phila., 1918, May.

Radiographs of the uterus, tubes and ovaries in which the uterine cavity has been injected with bismuth, introduced through the cervix, show the form of this cavity under various conditions; and also by what channels and under what circumstances the bismuth may escape from the u

If the tubes are patent the bismuth escapes into them; the ease with which this occurs varies with the degree of patency of the tubes These experiments suggest that intra-uterine irrigations are attended with the danger of some of the irrigating fluid at times escaping through the tubes into the peritoneal cavity; and also that fluid in the uterine cavity, under favorable circumstances (patent tubes, relaxation of the uterus, and obstruction in the cervix), may be forced into the tubes and peritoneal cavity. This is one way that salpingitis and peritonitis may arise.

If the endometrium is intact the bismuth will not escape into the venous uterine sinuses even though great force is used. If the patient is menstruating when the uterus is removed, the bismuth may gain access to them. If the endometrium is removed by curettage, the injection mass will usually escape into these sinuses. The ease with which this occurs varies with the size of the sinuses in the individual specimen and the degree of relaxation of the uterine

wall. Under favorable circumstances of venous hyperæmia and uterine relaxation, the bismuth easily escapes into the venous sinuses and into the venous circulation outside the uterus.

A study of uteri in which the venous system has been injected with bismuth through the uterine and ovarian veins shows a rich venous plexus in the endometrium and also one in the myometrium. The latter may be subdivided into a peripheral and radial plexus, situated in the peripheral and radial zones. Arcuate veins between the two zones convey the venous blood to the uterine plexus between the layers of the broad ligament.

Relatively large sinuses radiate from the base of the endometrium into the myometrium, and convey the blood from the endometrial plexus into the deeper portion of the radial. If these "receiving" sinuses are exposed by removing the overlying endometrium and the uterus is relaxed, thus holding the lumina of the "receiving" sinuses open, fluid and small solid material could easily escape from the uterine cavity into them and thence into the venous circulation outside the uterus.

Clinical experience has taught that solid material from the uterine cavity gains access to the venous circulation, as shown by puerperal infection and the presence of placental cells, benign and malignant, in the lungs of puerperal women. Experimentally solid material can be forced from the uterine cavity into the venous circulation under very little pressure if these sinuses are exposed and the uterus relaxed.

Anatomical and physiological studies demonstrate how this may occur, by exposure of the lumina of the receiving sinuses, uterine relaxation, and pressure in the uterine cavity greater than that in the sinuses. The author believes that uterine contraction following relaxation, when there is obstruction in the cervical canal and intra-uterine irrigation, may bring about this increased pressure and may force fluid, sterile or containing in suspension bacteria or placental cells, into the venous circulation. It is probably a frequent way, by which puerperal infection arises and placental cells reach the lungs.

ADNEXAL AND PERIUTERINE CONDITIONS

Mauclaire: Ovarian Auto- and Homografts in the Lower Edge of the Omentum (Autogreffes et homogreffes ovariennes dans le bord inférieur de l'épiploon). *Ann. de gynéc. et d'obst.*, 1917, xlii, 720.

The author reviews the recent literature concerning ovarian grafts. His earlier experimental attempts at ovarian grafting generally failed. Recently, because he thought the failures might have been due to the fact that the graft was placed in a poorly vascularized region, he has tried grafting the ovary in the omentum. He is aware that Hertlitzka and Foa experimentally grafted an ovary on the omentum but not within it.

In several of his patients, after having grafted the ovary in the omentum, he fenestrated the latter and hemmed the omentum all around the ovary. The secreted ova could then fall into the pelvis and be absorbed. It is known that normally the ovum falls often into Douglas' sac. But in some cases Mauclaire has sutured the preserved tube to the grafted ovary and thus the escaping ovum can enter the tube, obviating an extra-uterine pregnancy. It is well known now that pregnancy after an ovarian graft is no myth.

The author has made 10 intra-omentum ovarian autografts without complications and in 8 of these cases the patients have menstruated. The omentum has not absorbed the graft. The periods were sometimes early, sometimes much deferred and the discharge also varied in quantity. The author thinks that in the omentum the graft is rapidly vascularized in all its parts, much more so than when grafted in other regions.

The author has made 6 intra-omentum ovarian homografts. These were taken from patients operated upon for uterine fibroma in whom there was neither tuberculosis nor syphilis. In 2 of these 6 cases menstruation has returned. The difficulty in such cases arises from the fact that the donor of the grafted ovary has usually passed the fortieth year and the ovary is old. In the case of an ovary taken from a fibromatous woman of 33 years there was a good result. In one case not only did the menses return but the breasts secreted milk.

The summarized conditions for successful ovary grafting are: to operate aseptically and dispense with a general anæsthetic; not to contuse the ovary nor make fragmentary grafts; the bed of the graft must be highly vascular and the grafted ovary must be young. The recipient must be the same sex, species and race as the donor, and if a female she should not be pregnant.

A medicolegal question arises as to who is the true mother in the case of a homo-ovarian graft followed by pregnancy. Is it the donor of the ovary or the recipient?

Short histories are appended of the cases of autografts and homografts. W. A. BRENNAN.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Bevan, A. D.: Ruptured Extra-Uterine Pregnancy; Confusion with Appendicitis. *Surg. Clin. Chicago*, 1918, ii, 65.

Bevan reports a case of ruptured extra-uterine pregnancy in a patient who had been married six years and had never been pregnant. She was brought to the hospital with an acute abdominal attack, which came on forty-eight hours previously, without much temperature, some vomiting, and distinct tenderness over the region of the appendix, and pain so severe that she had to go to bed immediately at the onset. There was no history of pelvic disorder and the case was regarded as one of acute appendicitis.

Under ether anæsthesia the usual muscle-splitting appendectomy incision was made. Free blood was found in the peritoneal cavity. The blood was not fresh, contained some clots, and appeared to have been present for twenty-four or forty-eight hours. The right tube was distended. It was clamped and removed. The right ovary was left intact. The other appendages were normal. The case proved to be that of a tubal pregnancy. G. W. HOCHREIN.

Poucher, J. W.: Pre-Eclamptic Cæsarean Section. *Am. J. Obst.*, N. Y., 1918, lxxvii, 54.

Poucher strongly contends that in the pre-eclamptic state the safety of both mother and child depends upon emptying the uterus as rapidly as possible. He would not apply any rule of procedure to all classes of cases, but says:

"In women who have borne one or more children, where labor has safely begun, and the cervix thinned out, delivery may be easily and rapidly accomplished by means of rubber bags and normal dilatation under ether. This is the class of cases which I believe may be greatly facilitated by vaginal hysterotomy. But a large majority, 75 per cent or more, of eclamptic women are primigravidæ, many of them with rigid elongated cervices. In these cases delivery by rapid dilatation either with rubber bags, by manual manipulation, or even by hysterotomy, is a difficult task of sometimes many hours' duration and may in spite of the utmost care be fraught with danger to the child and, through toxæmia and infection, to the mother. In these cases cæsarean section offers by far the best results."

Since 1914 the author has treated twelve cases of pregnancy toxæmia, seven by cæsarean section, with no fœtal or maternal mortality. The other five cases were seen after they had been some time in convulsions, two being treated by cæsarean section, two by vaginal hysterotomy, and surgical interference in the fifth being refused. Of these but four mothers and one child survived.

Poucher's entire cæsarean experience has consisted in 51 cases and he is more than ever convinced that the time to stop convulsions is before they begin. Further, he does not believe that a patient in pregnancy toxæmia should be allowed to suffer hard or prolonged labor pains.

CAREY CULBERTSON.

Tomiselli, A.: Status Epilepticus in Pregnancy (Status epiletticus in gravidanze). *Ann. di ostet. e ginec.*, Milano, 1917, xli, 135.

The author draws attention to the similarity of the symptoms of epilepsy and eclampsia during pregnancy. While eclamptic convulsions are an indication for evacuation of the uterine contents, epileptic seizures do not indicate such a course. The details of a case are given.

The patient, aged twenty-five, was in the fifth month of pregnancy and came to the hospital with a diagnosis of eclampsia and a history of having previously suffered from convulsive seizures. During the first day in the hospital the patient had 11 convulsions. The nature of these, as well as urinary findings and the history, suggested epilepsy. An energetic bromide treatment was instituted. After a few days the symptoms subsided, the patient recovered, and the pregnancy proceeded to term with normal delivery.

The author refers to the literature on the subject to show that pregnancy does not aggravate epilepsy. He draws attention to the necessity of an exact and careful investigation of the symptoms, as the differentiation between eclampsia and epilepsy calls for separate treatment; that which is suitable for the one may be fatal for the other under the conditions. W. A. BRENNAN.

Solomons, B.: Notes of Two Obstetrical Cases: Epistaxis in Pregnancy; Albuminuria of Pregnancy. *Med. Press*, 1918, cv, 123.

The patient was a healthy primigravida, aged twenty-five. The family histories of the wife and husband were good. She had had several slight attacks, and when the author saw her the nose was bleeding profusely. The urine and blood-pressure were normal. The patient bled profusely for five days in spite of treament with coagulose, anterior packing and adrenalin. Forty-nine hours after posterior packing of the nose, she was delivered by forceps of a freshly macerated female child weighing five and three-fourths pounds, having been in labor for eight hours. The plug was removed the next morning. It had been in about two days and a half. The convalescence was marked

by slight pyrexia in the first week, but the patient was able to leave the hospital at the end of the third week.

Whether one can promise a non-recurrence of the bleeding in subsequent pregnancies, and whether, in the event of the bleeding occurring, if one would act differently, are matters for discussion.

The second case was one of albuminuria of pregnancy. The patient was put on a water diet and labor induced by Krause's method. A live baby and a healthy mother were the result.

EDWARD L. CORNELL.

McSweeney, E. S., and Wang, S. L.: Childbirth and Tuberculosis. *J. Am. M. Ass.*, 1918, lxx, 368.

After admission to the hospital, the taking of the history, the physical examination and the obtaining of specimens of urine, sputum, etc., were done in the general female admission wards where the patient was placed in bed for an observation period of about two weeks, as is the custom with all tuberculous patients. Then, in case of pregnancy, the pelvis was examined, a vaginal smear examined for gonococci, and Wassermann and gonococcic fixation tests made. After the usual two weeks of observation in the admission ward, where the stage of the disease and the mode of sanatorium treatment were determined, the woman was transferred to the obstetric ward. In the obstetric ward the care was the same as for all tuberculous patients, the amount of exercise allowed being dependent on the activity of the tuberculosis and the general rules observed in pregnancy.

These patients seemed well satisfied and their being together seemed to add to their contentment. Their meals were served to them in this ward and to satisfy their natural reticence, they were allowed to remain as much apart from other patients as they desired. This ward was not, however, closed to other patients, for this was not feasible and obviously not desirable.

When labor occurred, the woman was removed to the surgical pavilion for reasons of asepsis, and brought back to the obstetric ward shortly afterward. She was placed in a single room for two or more weeks and treated as any other maternity patient. The child was removed immediately after labor to the children's pavilion. The child was not permitted to nurse, being fed artificially from birth. The parents were advised that the child should be sent to a tuberculosis preventorium for one year at least, and if they aquiesced, this was done as soon as it could be arranged. The mother was confined to bed while the uterus was undergoing involution, and after this, if all things were favorable, she was cared for according to the usual sanatorium methods for tuberculous patients.

There were eighteen childbirths, one patient having two children born in the hospital, the second three years after the first birth.

Ten stated that the onset of their clinical tuberculosis occurred before pregnancy; of these, after labor four died, three seemed improved, and three seemed unimproved. Three stated that the onset of their clinical tuberculosis occurred at about the time they became pregnant; of these, after labor one died and two seemed improved. Five stated that the onset of their clinical tuberculosis occurred after they became pregnant; of these, after labor four seemed improved and one seemed unimproved.

During pregnancy, as near as could be ascertained, ten seemed to retrograde, five to improve and three were apparently unchanged.

After labor, of the moderately advanced, seven were improved; of the far advanced, five died, one improved and five were retrograde.

EDWARD L. CORNELL.

Mazzini, E.: Didelphic Uterus and Pregnancy; Torsion of the Gravid Cornua (Utero didelfo y embarazo; torsion del cuerno gravido; apoplegia utero-placentaria; ooforo-salpingo-hemi-histerectomia abdominal sub-total; curacion). *Semana méd.*, Buenos Aires, 1917, xxiv, 630.

The author reports the case of a primipara aged 22 years, with an unimportant previous and family history. She entered the hospital dyspnœic, pallid, with the abdominal facies, and discolored mucosa. Temperature was 35°, pulse 120 to 130. The tongue was dry, there was intense thirst, pyrosis, and vomiting. The abdomen gave the impression of a pregnancy at term. The fundus of the uterus showed in the hypochondriac region and left flank. The uterus was irregularly triangular in form. Its height was 33 cm., which did not agree with the state of the pregnancy, in the beginning of the seventh month. The upper segment gave a wooden dullness on percussion. In the lower third palpation was impossible owing to distention and hyperplasia. The patient stated that the uterus had commenced to increase two hours before her entrance into the hospital.

Examination showed a septum commencing at the vulva and continuing upward, giving the appearance of two vaginæ. Palpation discovered in the right vagina a vague and interrupted sensation of continuity between it and the neck of the gravid uterus in left lateroflexion. A diagnosis of didelphic uterus was made.

A median sub- and supra-umbilical laparotomy was done. The gravid hemi-uterus proved to be of a volume corresponding to term, of an intensely livid color and with a torsion of 180°. The left hemi-uterus was in forced lateroflexion. The gravid uterine horn was removed. The cervico-utero ligamentous pedicle was sutured and peritonized. Peritoneal phenomena persisted for 72 hours. Cicatrization was by first intention. The patient was up on the twentieth day.

On opening the tumor, about 500 ccm. of serohæmatic fluid escaped; the fœtus corresponded to the month of the pregnancy. On extracting the fœtus it was seen to be well developed. There was a

partial separation of the normally inserted placenta with hæmorrhagic subchorial suffusions and distention of its vessels.

The author gives detailed descriptions of the macro- and microscopical examinations with illustrations, and discusses the literature of the subject, comparing the points to his own case.

W. A. BRENNAN.

LABOR AND ITS COMPLICATIONS

Skeel, A. J.: Injuries Accompanying Labor. *Cleveland M. J.*, 1918, xvii, 83.

The author has kept records of careful examinations made two to six weeks postpartum for several years and finds that many cases considered satisfactory at the time of and even two weeks after delivery have remained with permenant uncorrected injuries. This led him to improve and modify obstetrical technique and postpartum care, achieving much better final results for the patient.

Labor injuries are divided into: (1) pelvic floor and outlet injuries; (2) cervix and vault injuries; (3) injuries of the supporting uterine ligaments. As much damage is caused by a large and hard head, it is best to safeguard the patient and child by not allowing the pregnancy to go over term; when reasonably certain that pregnancy has reached full term, labor should be induced.

Occiput posterior positions are responsible for a great deal of pelvic floor injury. There is usually a splitting of the pelvic wall into the ischiorectal fossa, an injury not readily discovered except by inspection with a speculum and a good light. The old custom of urging the patient to bear down causes the head to strike the upper portion of the levator ani muscle when the perineum proper is still perfectly safe. In patients with a narrow pubic arch unusual care should be taken during delivery, as this anomaly favors third degree lacerations. When the perineal muscles are very rigid, ether anæsthesia should be used to the point of relaxation. The vestibule and subpubic region should be protected. Uterine prolapse frequently follows rather than accompanies cystocele. Rupture of the anterior portion of the triangular ligament allows descent of the bladder with the uterus following it. In the repair of the perineum the muscles and fascia should be brought together with buried catgut sutures with a short curved needle, then the mucosa and skin are sewed up. In extensive injuries one or two silkworm stay sutures are inserted to safeguard premature absorption of the catgut. The cervix should be inspected and if suturing is required, the upper angle should be well united. This must be done under the strictest asepsis, and never in the presence of gonorrhœa or other infections. On account of the relaxed and stretched uterine ligaments retroversion is rather common following delivery. Prophylaxis is advised; avoidance of strain on the part of the woman, as well as avoidance of counterpressure over the fundus during the severe second stage. Free motion in bed is allowed early. The patient is urged to lie on her abdomen, whenever possible. Vaginal examination in twelve to fourteen days is made and if retroversion is found, the knee-chest posture is instituted, and later the uterus is replaced and a Smith pessary introduced. In old standing cases surgical interference may become necessary.

L. R. GOLDSMITH.

PUERPERIUM AND ITS COMPLICATIONS

Nyulasy, A. J.: The Care of the Puerperal Woman; Polypoid Decidual Endometritis. *Surg., Gynec. & Obst.*, 1918, xxvi, 331.

The first case of this condition was described in 1861 by Virchow. Since then various observers, notably Ahlfield and Nyulasy of Melbourne, have demonstrated the condition to be rather common. Syphilis is the most potent cause, though any low-grade irritant extending over a long period, such as the gonococcus or the common pyogenic cocci, may also act as an etiologic factor. It is a disease of the decidua, and may or may not lead to abortion; many of the typical cases occur after full labor.

Clinically it presents two types: either a tough, somewhat rounded polypoid eminence of various sizes, or leathery papillomatous outgrowths. There is a marked tendency toward infective changes. The symptoms may be abortion, adherent placenta or sepsis after the full-term placenta has come away perfectly clean. In such cases septicæmia may come on without noticeable fetor of the lochia, the patient having been apparently well and free from any premonitory symptoms.

Retarded involution with a patulous os admitting one or two fingers should be carefully watched, and the unduly large uterus explored under anæsthesia and the diseased decidua removed. This will prevent fatal septicæmia.

In the treatment the sharpest curette should be used for removing the decidua. The author found the bare finger nail a good aid to the curette. After curettage the uterus is packed with iodoform gauze, and in some cases intra-uterine douches are used for several days. On account of the enormous venous sinuses hæmorrhage may be very severe; this necessitates packing and another sitting. In an obstinate case it was necessary to do an anterior vaginal metrotomy to facilitate the removal of the decidua. The author has not lost any cases, unless grave septicæmia was present at the beginning.

Three illustrations of pathologic slides accompany the article.

L. R. GOLDSMITH.

Bassewitz: Two Cases of Placental Retention Treated by the Gabastou Hydraulic Method (Nota acerca de dos casos de retencion placentaria tratados por et metodo hidraulico de Gabastou). *Semana méd.*, Buenos Aires, 1918, xxv, 85.

Two cases are reported in which Bassewitz tried the new method of hydraulic detachment of the placenta devised by Gabastou of Buenos Aires. Ow-

ing to the dangers of manual extraction, the author proposed to inject into the placenta by the vein of the umbilical cord sterilized physiologic salt solution in sufficient quantity to obtain a kind of erection, followed by the formation of a retro-placental hydroma which greatly facilitates mechanical detachment of the placenta. In the first of the two cases in which the method was tried, elimination of the placenta by its fœtal face was obtained in five minutes. In the second case, however, manual detachment of the placenta was necessary.

The method appears to be effective in cases of total placental retention due to uterine inertia or to anomalous adhesions between the uterus and placenta. It is inefficient, or at least not sure, in cases of partial lateral detachment of the placenta which yield to the Duncan method. The method is dangerous and ought to be avoided in cases of lateral tubal placental insertion. W. A. BRENNAN.

MISCELLANEOUS

Berghausen, O.: Hæmorrhagic Disease in the Newborn Treated by the Injection of Citrated Blood in the Superior Longitudinal Sinus. *J. Am. M. Ass.*, 1918, lxx, 514.

The author reports a case of uncontrollable hæmorrhage in an infant, which he had delivered by forceps, treated by the injection of 150 to 200 ccm. of the father's blood in 2 per cent sodium citrate solution into the superior longitudinal sinus. Intramuscular injection of paternal blood, suture of the wound caused by the forceps blades, pressure, epinephrin, and a blood-coagulating substance all had been used without success. Also unsuccessful attempts had been made to introduce the citrated blood into a vein at the elbow and in the neck.

As a last resort, it was determined to puncture the superior longitudinal sinus. This was done and 150 to 200 ccm. of the citrated blood introduced. Immediate improvement in the child was apparent and no hæmorrhage occurred after the transfusion.

HARVEY B. MATTHEWS.

Salmond, W.: A Case of Ischiopagous Twins. *Lancet*, Lond., 1918, cxciv, 295.

The parents to whom this monster was born are both natives of Natal. The mother is about 27 years of age and had previously given birth to two healthy children. She had no special difficulty in the present labor and no medical man was present. The living monster was seen when it was seven days old, and as it did not seem likely to survive, it was photographed. It died the next day.

Both bodies were of the female sex and presented perfect vulvæ, but urine only escaped from one. There were also two anal orifices, but likewise fæces escaped from only one. Each mouth took food and the children cried independently. One child would sleep while the other remained awake. There were two hearts which did not beat synchronously, and the respiratory movements in each chest were independent. There was only one umbilical cord. There were normal movements of all the four arms and of two legs. The third, or fused, leg had nine toes. The evidence of movement was less apparent at the ankle and knee-joints and absent at the hip, although there was a distinct articulation to the single pelvis.

An unsuccessful attempt was made to secure the skeleton. EDWARD L. CORNELL.

GENITO-URINARY SURGERY

KIDNEY AND URETER

Hirsch, E. F.: A Papillary Carcinoma of the Kidney with Metastasis in the Brain. *Arch. Int. Med.*, 1918, xxi, 231.

So rare is papillary carcinoma of the kidney that only twelve cases of such tumors have appeared in the literature.

The author's case was one which at necropsy showed a soft, fleshy tumor in the left kidney and a large tumor thrombus projecting in the corresponding vein. In addition there was noted another tumor definitely metastatic in the anterior pole of the left temporal lobe of the brain.

The patient was an adult, fifty-eight years of age, who had been admitted to the hospital about eight weeks before death with a rather indefinite history of a skull injury. At the time of the admission there were some disturbances in mentality, which led the attending surgeon to perform an operation upon the calvarium. About ten days later a second exploration of the cranium was made. There was no improvement in the condition and the patient gradually grew worse mentally, finally dying in a state of apathy and emaciation.

The microscopic examination showed a malignant papillary tumor which had arisen in the renal parenchyma.

The brain tumor showed a histologic structure similar in most respects to the tumor found in the kidney.

P. H. KREUSCHER.

Chevassu, M.: War Wounds of the Kidney (Plaies de guerre du rein). *Bull. et mém. Soc. de chir. de Par.*, 1918, xliv, 81.

Chevassu's report is based on 56 kidney war wounds observed, 46 being recent and 10 being old wounds. Hæmaturia does not necessarily accompany a renal wound, and in 12 cases in which a renal lesion was actually verified there was hæmaturia in 5 only. The kidney wound was accompanied by a liver lesion 11 times, by a lung lesion 9 times, and by lesions of other viscera in 11 cases. In 21 cases the kidney lesion was isolated.

The conditions which make an isolated kidney wound dangerous are hæmorrhage and infection. In 46 fresh kidney wounds severe hæmorrhage was observed in 6. In 3 of these cases where there was a concomitant liver wound, the patients died. In 3 of the cases the hæmorrhage was a hæmaturia; 2 died within a few hours. In 5 cases a perirenal hæmatoma was produced. Of 35 remaining patients who showed no special symptoms necessitating immediate action, a primary operation was done in 11 cases, a secondary operation in 2, and abstention was observed in 22. The primary operation consisted either in a nephrectomy or in cleansing and drainage of the trajectory. Of 3 nephrectomized cases, 2 died; of 4 tamponed patients, 3 died; 1 hæmatoma drained recovered; 5 clearance and drainage operations recovered; 22 abstentions from surgical intervention gave 3 deaths and 19 recoveries.

Classified according to the nature of projectile, 21 shell wounds gave 16 evacuated and 5 dead; 14 bullet wounds gave 10 evacuated and 4 dead; 28 cases with projectile retained gave 10 deaths; 18 seton wounds gave 4 deaths. The very considerable proportion of dead in the case of retained projectile is due to the persistence of hæmaturia and secondary hæmorrhage.

A severe hæmaturia of itself is never an indication for nephrectomy unless abundant and persistent. The kidney is of itself perfectly able to effect hæmostasis in the majority of cases and should not be removed unless the hæmorrhage really threatens the patient's life. The author's experience leads him to think that tamponing never suppresses a kidney hæmorrhage which will not stop spontaneously.

In cases of severe hæmorrhage transfusion of citrated blood undoubtedly renders immense service.

In the case of seton wounds the author thinks the indication is generally for abstention; also in cases where there is a retained projectile, because many projectiles retained in the kidney region, not necessarily in the kidney, are well tolerated, particularly if small; because many require a large opening up for their removal; and also because treatment of the supposed infected renal wound is hazardous if a partial nephrectomy is not done and there is often the temptation to do a total nephrectomy.

Only very large projectile fragments capable of being removed without extensive opening up appears to the author to be a motive for operation. Others may be left and removed later if they give rise to complications.

The author's experience and examination of old cases of kidney wounds show it a well established fact that a large number show no stigma which can be discovered by the most precise methods of functional tests. Such a fact should indicate conservation in the treatment of kidney wounds.

W. A. BRENNAN.

Sargent, J. C.: Chronic Non-Surgical Pyelitis; Its Etiology and Treatment. *Wisconsin M. J.*, 1918, xvi, 400.

Sargent has made a study of seventy-five cases examined and treated at the James Buchanan Brady Urological Institute of Johns Hopkins Hospital.

He says that recent experimental investigations and clinical studies have warranted the general belief that pelvic infections are usually if not always hæmatogenous in origin and that it is quite conceivable that a chronic pyelitis might be constantly kept up by organisms occurring in the urine as a result of a focal source of infection in the intestinal tract or elsewhere.

The author reports the case of a patient who suffered from a bilateral pyelitis dating back twenty years to an injury of the deep urethra. His entire treatment consisted of eighteen lavages, and there was no improvement until a traumatic pocket was found in the deep urethra from which pus was seen to escape. Following the cure of the infected pocket, the pyelitis reacted to lavages. This case seems to prove the relationship between a pyelitis and a focus of infection in the urethra.

Six of Sargent's cases of chronic pyelitis associated with a chronic prostatitis and seminal vesiculitis were cured of the pyelitis but not of the bladder infection. In all six cases the pyelitis recurred. He claims in these cases that the chronic infection of the prostate and seminal vesicles was the source of the organisms that produced the reinfection of the kidney pelvis. About one-third of his cases of chronic pyelitis were cured very easily and did not show any tendency toward recurrence.

Sargent's treatment of chronic pyelitis consists of repeated direct applications of some irritant antiseptic to the inflamed kidney pelvis. Silver nitrate has been given the preference because it is both irritating and antiseptic. The lavages should be repeated at intervals of a week or ten days until the ureteral urines have been found to be free from organisms. The injection should be of one per cent strength at the first sitting and, unless it is followed by a severe reaction, a two per cent solution should be used the second time.

The strength of solution is increased at each sitting until one has been used which produces an annoying but bearable amount of renal discomfort for a day following the lavage. Some patients cannot take a solution stronger than one per cent. Others will not experience a reaction until a five per cent solution has been used.

Hexamethylenamine is used as an adjunct in the catheterization treatment of chronic pyelitis. To be of any value, the urine must be rendered acid.

His conclusions are as follows: First, there is apparently some relation between the chronic infections of the kidney pelvis and a focal infection elsewhere in the body, usually some intestinal disturbance; less frequently an infection of the middle ear, the tonsils, or teeth. Second, chronic infections of the prostate and seminal vesicles are occasionally the source of organisms producing and supporting a chronic pyelitis. Third, in the treatment of chronic pyelitis a focal source of infection should be sought and if found, treated. Fourth, in the local treatment of chronic pyelitis, the solution of silver nitrate should be used in sufficient strength to produce an annoying but bearable amount of renal discomfort.

LOUIS GROSS.

Sellers, C. A.: Infections of the Urinary Tract in Infants and Younger Children Due to the Bacillus Coli Communis. *J. Indiana St. M. Ass.*, 1918, xi, 108.

Sellers gives his results from a study of infections in infants and younger children due to the whole family of coli, and also from the information gained from a questionnaire sent to 600 physicians.

He lays particular stress on the examination of the urine as a means of diagnosis neglected by most physicians; and claims that pyelitis is simply a disease overlooked and one of the most probable causes of obscure fever.

His conclusions are as follows:

1. Acute pyelocystitis is being overlooked in infancy because of the neglect of a routine microscopical urinary examination in all cases.

2. While the condition is more frequent in female children, still there are many cases in males which have been overlooked.

3. The theory that acute pyelitis is always an ascending infection with the colon bacilli from the soiling of the vulva is losing its hold. The belief is justified that there is some other cause in which either the kidney resistance is below par or that there are conditions in the body fluids that increase the virulence of the colon bacillus.

4. Acute pyelitis is probably never primary.

5. The disease as a rule responds promptly to alkaline treatment, especially potassium citrate or guaiacol through rendering the urine alkaline. Urotropin and vaccines are most disappointing, and their use in young infants is to be questioned.

LOUIS GROSS.

Rowan, C. J.: A Summary in Symposium on Surgical Conditions of the Kidney. *J. Iowa St. M. Soc.*, 1918, viii, 49.

Rowan considers especially worthy of emphasis three points:

1. The fact that most surgical conditions of the kidney are not diagnosed nearly as early as they should be.

2. The importance of careful microscopic urinalysis in obscure or atypical cases which seem to indicate a surgical intra-abdominal condition.

3. The inestimable value of the functional tests.

As examples of late diagnosis cases he cites hypernephroma, renal tuberculosis in some cases, and the procrastination resultant from symptoms of cystitis which in reality are kidney cases.

Under the second point, Rowan contends that more careful searches for blood, pus and bacteria by the microscopist will help to clear up many so-called cases of appendicitis and other vague diagnoses.

Functional tests, although only a link in the chain of diagnostic aids, are of much value. He

rightly warns however that they should be used only in conjunction with careful physical examination and observation and good surgical judgment.

H. W. E. WALTHER.

Loeb, L.: Further Investigations on Auto- and Homoplastic Transplantation of Kidney Tissue. *J. Med. Research*, 1918, xxxvii, 229.

In a series of studies it was the author's aim to analyze the factors determining the fate of transplanted tissue and especially to determine the cause of the difference in the behavior of tissue after auto- and homotransplantation.

As a step in this investigation Myer investigated previously the fate of kidney tissue transplanted into a pocket of the ear of the guinea-pig. There was reason to assume that the particular place of transplantation, namely, a pocket in the ear, had some influence on the fate of the transplanted tissue, and they decided therefore to resume this investigation and to study kidney tissue after transplantation into the subcutaneous tissue of the dorsal or anterior aspect of the abdominal wall. It was to be expected that if there should be any difference it would concern especially the later stages, and therefore they gave particular attention to these.

The author gives in great detail the results of a series of experiments. He found that the effect of auto- and homotransplantation depends, among other factors, upon the place of transplantation. In the former series of transplantation he used a pocket in the ear of the guinea-pig and found that under these conditions the destruction of the homotransplanted tissue was complete after the twenty-first day following transplantation, while the autotransplanted tissue suffered under the influence of ingrowing connective tissue, but was not yet quite destroyed at a period thirty-eight days after transplantation.

While in their first series it was clear that the number of lymphocytes was considerably greater in the homotransplanted than in the autotransplanted piece, this difference came out much more markedly in the new series. Occasionally some lymphocytes were found, either around the tubules or in the capillaries of a glomerulus in the autotransplanted piece. They were especially found at places where the connective tissue was increased around the tubules. But on the whole, they were either absent or present only in a very small number after autotransplantation.

It was different after homotransplantation; here they were a very prominent feature. They became distinctly noticeable nine days after transplantation and remained from then on a constant accompaniment of the transplanted tissue, usually increasing in quantity as the time progressed. They appeared at first around and in the peripheral zone of living kidney tissue; they collected in increasing numbers around the tubules, penetrated into the lumen of tubules and also into glomeruli. They isolated tubules from the surrounding tissue and invaded and substituted the tubules at times. Thus they were a factor in the destruction of tubules; this destruction of tubules by lymphocytes was noticeable after the tenth day and persisted from then on. They also penetrated into the necrotic or organized center of the transplanted piece; however, they were present here in smaller numbers. At later times they were also found to fill almost completely capillaries which traversed the transplanted piece.

In both the autotransplanted as well as in the homotransplanted piece connective tissue was growing. It surrounded the tubules and glomeruli in the peripheral rim of living tissue, and proceeded into the central necrotic material. There was, as far as Loeb could judge, a greater ingrowth of fibroblasts between the tubules of the homoplastic than between those of the autoplastic piece. The distances between the living tubules were greater in the homotransplanted piece. The presence of large numbers of lymphocytes in the connective tissues made an accurate determination of the newformed fibrous tissue difficult. All indication, however, pointed to the conclusion that the amount of connective tissue was actually greater in the homotransplanted piece. This was especially apparent in the second period in the time following the first two weeks after transplantation. In the autotransplanted piece the tubules often formed lobules of closely approximated tubules, bands of fibrous tissue separating the different lobules, while in the homotransplanted pieces there was more connective tissue around the individual tubules. Such strands of connective tissue around individual tubules were, however, not altogether absent in the case of the autotransplanted piece.

In both the auto- and homotransplanted pieces the peripheral zone of living tissue surrounded a central necrotic area. The size and character of this central area varied in different animals. At first they found here necrotic kidney tissue which stained pink with eosin, and in which the shrunken nuclei were still visible. The fibroblasts migrated then in the peripheral part of this necrotic material, first between the necrotic tubules, and later into the tubules. Phagocytes appeared which took up some of the necrotic material and as a result of this activity the pink-staining necrotic material was transformed into a hyaline material, which stained light or had a yellowish tinge as a result of admixed coloring matter derived from hæmoglobin, which either diffused into the necrotic center or which was distributed through phagocytes. Later the whole necrotic center was transformed into this lighter staining material. However, the organization of this material by connective tissue remained incomplete throughout the period of experimentation. The central necrotic tissue had become transformed under the influence of host cells, but it had not been completely substituted by them.

The tubules which composed the transplanted kidney tissue had a simple structure similar to those

of the collecting tubules of the kidney. The glomeruli, as far as they remained preserved, seemed to become smaller and more hyaline.

The author observed not rarely in the transplanted thyroid and also in the mammary gland of the mouse a coalescence of acini which thus formed larger cavities. The same occurrence was observed occasionally in the transplanted kidney tubules. As a result of degenerative changes, the separating walls disappeared and a small cyst was produced at times.

The fate of kidney tissue after auto- and homotransplantation was markedly influenced by the place of transplantation. Tissue transplanted into the ear of the guinea-pig was destroyed much more rapidly than tissue transplanted into the subcutaneous tissue elsewhere.

The main difference between auto- and homotransplanted pieces consisted in the lymphocytic reaction, which was much greater around the homotransplanted tissue. The lymphocytes actively participated in the destruction of homotransplanted tissue. This lymphocytic reaction seemed to be independent of the loss of weight of the animals during the period of the experiment. Furthermore, it did not seem to be noticeably influenced by the presence of bacterial infection at certain places of the transplant.

On the whole, the lymphocytic reactions showed a similar intensity and a similar time curve in the case of the kidney as in the case of the thyroid. If there was a difference, it was in favor of a greater intensity in the kidney.

Fibroblasts grew as well into the homoplastic as into the autoplastic kidney tissue, but the amount of ingrowing connective tissue was, as far as could be determined, greater in the homoplastic tissue. The connective tissue seemed to participate in the destruction of tissue by exerting a pressure on certain parenchymatous structures.

In the kidney as well as in the thyroid an organization of the necrotic center took place after transplantation. The rapidity with which the organization took place, however, was greater in the case of the thyroid. The necrotic center of the kidney was more resistant to the organization. Under the influence of the ingrowing connective tissue cells and phagocytes, the necrotic material in the center became transformed from a substance staining red with eosin into a material pale and hyaline.

The curve of mitotic proliferation in the transplanted kidney tubules was definite. After the seventh day the intensity of proliferation began to decrease markedly and came almost or entirely to a standstill twenty-seven to thirty days after transplantation, although at that period the transplanted kidney tubule still lived under abnormal environmental conditions.

If there was a difference in the frequency of mitoses between the auto- and homoplastic pieces, it was in favor of the homotransplanted piece; and especially those tubules were liable to show some mitoses which were in process of destruction by lymphocytes and connective tissue in the homotransplanted piece. The injury of the tubules seemed to constitute a secondary proliferative stimulus, leading to mitoses in the homoplastic pieces.

GEORGE E. BEILBY.

Hunner, G. L.: Ureteral Stricture; a Report of 100 Cases. *Bull. Johns Hopkins Hosp.*, 1918, xxix, 1.

This very comprehensive and most interesting report of ureteral stricture is based on the author's personal experience of 100 cases, although the general conclusions are based on an experience of over 150 cases.

After reviewing the various theories that have been advanced from time to time regarding the etiology of ureteral stricture, such as the congenital origin, gonorrhœa, inflammations, the influence of the trauma of labor, syphilis, and the possible relationship between infected cervical glands and stricture, the author has come to the belief that the majority of ureteral strictures, excluding those of tuberculous origin, have their origin in an infection carried to the walls of the ureter from some distant focus, such as diseased tonsils, sinuses, teeth, or the gastro-intestinal tract. This conception of stricture postulates that in the majority of cases ureteral infiltration is primary, and that the other urinary tract lesions so often associated with stricture, such as stone, hydronephrosis, pyelitis and pyonephrosis, are secondary.

The discussion of the symptoms is considered under the following headings:

1. Pain. According to the author, pain is the most universal symptom and only in rare cases is it absent. Since the author made his first report, based on fifty cases, he has studied his cases more carefully and obtained better histories, so that it is rare to find a patient with stricture who does not complain of a pain or of a nagging discomfort in the site of the ureteral inflammation. The pain may radiate toward the kidney, into the hips, groin or sacro-iliac joint, or over into the thigh and leg. Next in frequency to the local ureteral pain is pain in the kidney, probably referred at times, but usually due to an overdistended pelvis. Discomfort in the bladder and frequency of urination are not uncommon.

2. Urine examination. The urine may be quite negative. If there is an associated pyelitis, the urine shows the pathologic features and variations common to that condition.

3. Chills and fever. These are common in the cases with urinary infection.

4. Gastro-intestinal symptoms. These the author states are common, arising either as a central nervous system reflex or as a result of toxic absorption. The symptoms vary from a slight aversion to food to the most extreme nausea and vomiting. Rectal tenesmus may be present. Another symptom that may result from ureteral stricture is colitis.

5. Morbid anatomy. Hunner has had an opportunity to study the stricture macroscopically in about 15 cases, as a result of which he states that the inflammatory area varies from a slight annular thickening in the ureteral wall to a condition of diffuse cartilage-like thickening which may occupy several centimeters of ureter and form a mass a centimeter in diameter. Multiple annular strictures are not uncommon. Peri-ureteritis may be present. The microscopic picture (based on three cases) is one of chronic inflammation of all coats of the ureteral wall. The largest number of strictures were located in the broad ligament region, and the next most frequent location was at the bifurcation of the internal iliac vessels.

These locations are not in accord with the generally accepted view that ureteral stricture occurs at the points of congenital narrowing.

The effects of the stricture on the upper urinary tract the author believes to be in the following sequence: focal infection settling in the wall of the ureter, stricture formation, stasis and secondary infection. The author states further that although it is believed to have been demonstrated that most cases of dilatation of the kidney pelvis are due to mechanical obstruction in the form of ureteral stricture, a surprising development has been the fact that many cases of ureteral stricture causing typical symptoms are not associated with a dilated pelvis, and when the pelvis is not dilated, it is often contracted.

Pyelo-ureterograms in some of the cases showed the ureter contracted as well as the pelvis, and in others the pelvis was contracted and the ureter slightly dilated.

For the purpose of discussing the presence of infections, the author divides them into two groups. In the first 50 cases there was a bacteriological report in 27 cases, of which 9, or 33⅓ per cent, were sterile. In the 18 infected cases the colon bacillus was obtained in 13 cases, in 4 cases a staphylococcus was grown, and in 1 case a pure culture of typhoid was obtained.

In the second group of 50 cases all were studied bacteriologically. In 11 cases infection was present, 8 with the colon bacillus, 1 with a staphylococcus, 1 with a streptococcus, and 1 with an unidentified organism. In four cases the infection was bilateral.

Regarding the influence of ureteral stricture on stone formation, the author believes that at present there is abundant evidence to indicate that the stone results from urinary salts being deposited in the inflamed surface of the stricture area. He furthermore states that there can be no doubt that an occasional stone formed in the kidney is caught in a normal ureter. On the other hand, he believes that some stones found in the kidney were originally formed on the site of a ureteral stricture and after sufficient dilatation of the tract above, these stones float up into the kidney and increase in size.

As to the influence of stricture on the pyelitis of pregnancy and the puerperium, he believes that the stricture is probably present before the pregnancy in most of the cases, and the added congestion of the tissues after conception sets up a slight hydronephrosis which becomes infected during or immediately after pregnancy.

The diagnosis of ureteral stricture is based on the history, urinary examination, palpation of the abdomen with special reference to the kidney and ureter regions, palpation of the ureter through the vagina or rectum, cystoscopy, catheterization of the ureters by specially prepared catheters and roentgenography. The crucial test in diagnosing stricture is made with the wax-bulbed catheter. The author does not consider obstruction to an entering catheter as diagnostic of ureteral stricture, while he considers repeated obstruction at the same point as being suggestive; for a positive diagnosis he depends entirely upon the obstruction or "hang" of the wax bulb on withdrawal.

The use of pyelo-ureterograms as a rule is not necessary. Formerly the author refused to use the roentgen ray in making his diagnoses; he now uses it in most cases for the satisfaction of its confirmatory value.

The various lesions that must be considered in the differential diagnosis are briefly discussed; these embrace the urinary tract, genital tract, gastro-intestinal tract, various joint and nerve lesions and mental disorders.

The treatment is considered under two headings, non-operative and operative.

The author is to be commended for his strong stand favoring the treatment of ureteral stricture by means of non-cutting measures, for he states that "the ideal treatment for stricture of the ureter is by dilatation from the vesical approach." As a rule, the author uses the olive-tipped catheter, carrying a wax bulb 8 to 10 cm. from the wax-tipped end. The whistle tip catheter of Garceau may also be used. If these catheters fail, one may resort to the use of the metal searcher.

The bulbs which the author used are made of pure beeswax, which he says is soft enough to get an impression of a stone and firm enough to hang to the catheter.

At times one may fail to enter the stricture with the above methods, in which instance the first dilatation may be obtained by using whalebone filiform searchers.

The author warns against investigating or treating a stricture too frequently, and also against using the bulbs too large, as this may result in trauma of the ureteral mucosa; nor should too much force be used in pushing the catheter in.

Distant foci of infection should be treated at the same time.

Under certain circumstances all methods of vesical approach may fail, so that one may be obliged to resort to operative measures which, however, should not be undertaken until a complete examination of both sides has been made.

If investigation reveals stricture of one ureter

associated with a kidney of little or no functional value, the kidney should be removed.

In strictures high up, some sort of pyelo-ureteroplasty, as recommended by Fenger, may be justified. In some instances of valve-like obstruction, the condition may be relieved by simple fixation of the kidney. When the narrowing is found at the pyelo-ureteral junction, a pyelotomy and dilatation may be done in addition to the kidney fixation.

The author recommends for use in some of the cases retrograde dilatation, that is, by first exposing the ureter extraperitoneally, incising the dilated ureter above the stricture and then passing bougies or metal sounds. H. L. KRETSCHMER.

BLADDER, URETHRA, AND PENIS

Escat, J.: Treatment of Wounds of the Bladder and Urethra (Traitement des plaies de la vessie et de l'urètre). *J. d'urol.*, Par., 1918, vii, 161.

Among 140 war wounds of the genito-urinary apparatus treated in Escat's special urological center since March, 1915, there were 26 bladder and urethral wounds which were about six and seven months old when received.

Generally bladder wounds are associated with other injuries; in only 8 of the 26 was the bladder the only organ injured. In all of the cases there were pubic fractures and in several cases the intestines had been perforated. Usually a sacral fracture was not observed, lesions of the anterior pelvic girdle being predominant, giving rise to an osseous fistula in addition to the urinary fistula. The association of these two lesions, with occasionally involvement of the intestine, furnishes obvious general indications for early and thorough treatment.

In 20 of these cases no special operation had been done. Escat thinks that while there were probably good reasons for this at the front formations, there appear no sufficient reasons why such lesions, in many cases with a foreign body in the blædder, should have been left for several months in the base hospitals without adequate operations which would have prevented aggravation and hastened repair.

The great value of an early cystostomy in complicated wounds of this kind is that it furnishes at once a means of diagnosis and treatment. It not only permits the removal of foreign bodies but also action on bone lesions opening into the bladder.

The author points out the very great value of early systematic radiography of the pelvis to discover the extent and situation of bone lesions.

Pubic bone lesions call for a careful toilet of the area and the creation of counteropenings so as to avoid osseous intravesical fistulæ. Immediate and blind drainage of wounds communicating with the bladder cannot give the same security as the regular drainage of this organ. The question of proper drainage needs very special early attention. Drainage of the bladder by regular cystostomy, clearing of the area around a pubic fracture, and careful toilet of the bone are sufficient for a rapid recovery.

An immediate or very early cystostomy allows continuous drainage of the sources of infection and of the fistulæ; it obviates immediate or end complications by the removal of foreign bodies; rapid cicatrization is effected in simple and complicated cases. Deviation by an iliac anus in cases of vesico-intestinal perforation is useless in the majority of cases and has only very limited indications. Post-operative care and the maintenance of the cystostomy are as important as early operation.

The 37 cases of urethral wounds treated were on an average of seven months old. The primary treatment had been as follows: in 18 cases simple dressings only, no operation; in 4 cases, either perineal drainage or by the wound; 13 cases were treated by repair of the urethra; 12 cases were treated by hypogastric deviation of the urine, in 7 of which there was a cystostomy. In general the immediate results of all these treatments were good but the end-results were poor. No matter what treatment was employed, all wounds of the anterior urethra have been followed by traumatic stricture and frequently by fistulæ of various degrees. The author draws attention to the absolute necessity of long postoperative attention to the complications arising in urethral wounds.

The study of the cases leads the author to conclude that traumatisms of the urethra should be primarily operated upon in two stages. The first immediate operation should be directed against retention and infection, consisting of a hypogastric deviation of the urine and preparation of the tissues by wide and methodical urethroperineal excisions. The later operation should effect reparation either by urethrorrhaphy or autoplastics, the deviation of the urine being still continued as before. The efficacy of these procedures depends on the continuance of special postoperative care in the urological centers. W. A. BRENNAN.

Cathelin, F.: Surgical Treatment of Non-Fistulous Strictures of the Scrotoperineal Urethra Following War Wounds (Traitement chirurgical des rétrécissements de l'urètre non-fistuleux scroto-périnéaux suite de blessures de guerre). *Progrès méd.*, Par., 1918, p. 66.

Cathelin draws attention to the many occasions in which an injury or interruption of the scrotoperineal urethra justifies the army surgeon in opening the bladder suprapubically for drainage. Many cases of subcutaneous rupture of the scrotoperineal urethra either with or without suprapubic incision having been done, as referred to, reach the author's reparatory urological clinic.

In making an urethral repair operation, typical urethrectomy cannot be applied in these war cases owing to the perineal disorder and the difficulty of finding the separated ends of the urethral tube.

Since 1916 Cathelin has devised a technique by retrograde catheterization of the urethra from the bladder and direct through the meatus. After thus identifying the two ends of the urethra he

approximates them and makes a canal through the new-formed tissue between the two ends which have been anchored. The previous opening of the bladder facilitates the operation, which occupies only a few minutes. The bladder is kept open for at least a month and a retention catheter kept in place in the new canal until on cicatrization the latter is found to be complete. The bladder opening is then closed.

In a few cases recently operated upon by Cathelin, the newly made canal has remained in excellent condition up to the time the patients left the hospital. One of these patients had had a typical urethrectomy with circular urethrorrhaphy without any success even with suprapubic drainage. The anatomic results of these new-formed perineal canals and the action of the urethral mucosa in connection with it are matters for the future to show. It is well to dilate the canal with sounds occasionally.

W. A. BRENNAN.

MISCELLANEOUS

Wolfer, J. A.: Urinary Extravasation. *Surg., Gynec. & Obst.*, 1918, xxvi, 296.

Urinary extravasation is a complication of many pathological processes of the urinary tract. It may be compared to perforative peritonitis in diseases within the peritoneal cavity.

Normal sterile urine is absorbed with no local lesion, as shown by experimental guinea-pig inoculation, but produces necrosis when marked pressure is produced, not unlike the action of water or salt solution in this respect; however, septic urine is very toxic, producing œdema, necrosis and sloughing, regardless of the pressure under which it is placed.

Twelve cases reported by Wolfer are divided into two groups: (1) extravasation of normal urine, where there has previously been no stenosis of the outlet. The causative factor is trauma. Acute local disturbance and septis appear only after pressure necrosis begins. These patients may spontaneously recover by the closure of the perforation, but cases often terminate fatally if sepsis intervenes. The operative results are uniformly good, if performed before necrosis has taken place, by closure of the perforation with drainage; (2) extravasation of septic urine, which is practically always associated with urethral stricture; this group constitutes the vast majority of such patients.

Infection sooner or later is produced proximal to urethral stricture resulting in granulation production and tortuosity of the canal with pocket formations; the bladder wall becomes thickened and fibrous, and loses its elasticity. Complicating pathology such as prostatitis, seminal vesiculitis, and periurethral abscess is often seen.

Causes of extravasation with stricture are:

1. Stricture of the urethra with retention followed by suprapubic puncture.. This often results in extravasation through the trocar opening of septic urine, and a fatal result ensues. Suprapubic puncture may be done if a fine catheter is left in place and further drainage of the bladder instituted within a few hours.

2. Stricture of the urethra, with perforation by an instrument. The superficial perineal fascia and the triangular ligaments divide the perineum into two more or less closed compartments. Instruments usually perforate at the membranous urethra, causing extravasation into the deep space behind the triangular ligament. Here the urine must perforate the triangular ligament and appear in the anterior compartment or it becomes perivesical in the space of Retzius. Suprapubic cystotomy and incisions laterally in the perineum down to the deep compartment are all that is required; the urethral stricture must be treated later. If untreated, early gangrene takes place in the deep structures and soon appears superficially. Wolfer strongly suggests that the best method of treatment now is suprapubic drainage with wide drainage of the infiltrated areas, avoiding the urethra which is to be treated by means of sounds and filiforms from the suprapubic opening. He allows the suprapubic opening to close only after the urethra has been dilated to admit a 30 French sound.

3. Stricture of the urethra with perforation due to infection. The onset is often accompanied by a chill, severe shock supervenes, and rapid disintegration of the tissues results; death often follows. Findings simulating a deep peri-urethral abscess, together with the above symptoms, should suggest the diagnosis in most instances.

The treatment is exactly similar to that for extravasation following instrumental perforation.

HARRY CULVER.

SURGERY OF THE EYE AND EAR

EYE

Pierson, P. H.: Tuberculosis of the Eye. *Calif. St. J. Med.*, 1918, xvi, 74.

The lymphatics and blood supply of the eye, which are generally the methods of infection with and spread of tuberculosis, are described, the manifestations and differential diagnosis of tubercular lesions are considered, and a plea made for the more frequent use of tuberculin in diagnosis and treatment of eye disease, which is stated to be as specific for tuberculosis as the Wassermann test is for syphilis.

A general reaction is not enough; to consider the test positive, a change should take place in the eye itself and after each injection the eye lesion should be examined as regularly as the temperature chart. The reaction may take the form of hæmorrhage; Axenfeld and Stock found that hæmorrhages into the vitreous which commonly accompany retinitis proliferans were often due to tuberculosis.

Endeavor should be made to use the smallest dose that will produce a reaction; if recurrences take place or relapses occur, another kind of tuberculin may be tried with value.

Treatment should be general as well as with tuberculin. S. S. Howe.

Gibson, W. S.: The Etiology of Phlyctenular Conjunctivitis. *Am. J. Dis. Child.*, 1918, xv, 81.

Gibson presents an exhaustive clinical, experimental, and pathological study of the etiology of phlyctenular conjunctivitis. While this disease manifests itself as a local condition in the eye, it has long been recognized by both ophthalmologists and pediatricians that there is some underlying systemic condition. Nearly all of the work, if one may so designate a large part of the speculation that has been indulged in on this subject, has been done by ophthalmologists whose fitness for studying a fundamentally pediatric problem has naturally been limited. Gibson has approached the subject from the pediatric standpoint, and this gives his work a peculiar value.

Ninety-two consecutive cases, nearly all diagnosed and referred from the associated eye clinic of Brown Pusey, were studied intensively with reference to all of the theories that have been advanced as to the etiology of this disease. These included bacterial infection from without, exposure to wind and dust, errors of refraction, herpes, eczema, pediculosis, diseased tonsils and adenoids, intranasal conditions, gastro-intestinal disturbances, auto-intoxication, impairment of general health, bad living conditions, scrofula, the exudative diathesis, and tuberculosis.

A complete history of each case was obtained, the patient examined from every angle, and in a large consecutive number of cases the home conditions, the blood, and the urine were investigated. With the exception of tuberculosis, no one of these conditions either local or general could be found with sufficient frequency even to suggest any direct influence in producing the disease. On the other hand, 90 of the 92 cases gave a positive Von Pirquet reaction, and in the two negative cases the diagnosis was frankly questionable. In other words, while only a fraction of the cases showed clinical lesions of tuberculosis, practically all of them had tuberculosis as shown by the Von Pirquet test, whereas only about 25 per cent of all children of like age and under like conditions give a positive reaction.

A large number of experiments were conducted on healthy and previously tubercularized rabbits aiming to produce phlyctenules by the use of tuberculin subcutaneously; by merely tuberculizing the rabbits; by instilling tuberculin and staphylococcus vaccine into the eyes of both healthy and tuberculous rabbits; and by subconjunctival injections of tuberculin. In no case did phlyctenules occur in the eye of a healthy rabbit, while in those that had previously been made tuberculous 8 showed typical phlyctenules; they occurred six times as a complication of a conjunctival reaction resulting from the instillation of tuberculin, and twice in the absence of any local irritation of any kind. Clinically these phlyctenules were identical with these occurring spontaneously in the human eye; pathologically they resembled them closely. The microscopic findings suggested a tuberculous origin.

Gibson concludes his summary with the statement: "All clinical, experimental and pathologic evidence points to tuberculosis, and tuberculosis alone, as the cause of phlyctenular disease." Five excellent microphotographs of experimental phlyctenules occurring in tuberculous rabbits both spontaneously and at the height of a conjunctival reaction resulting from the instillation of tuberculin, and one of the adjacent limbus are included in the paper. Joseph Brennemann.

Bonnefon: A Study of Corneal Grafts (Étude des greffes cornéennes). *Lyon chirurg.*, 1917, xiv, 903.

The author's experimental work has demonstrated that experimental corneal grafts have given wonderful results as regards transparency in the animals experimented on. Nevertheless, these results, apparently so favorable as regards the survival of transplanted tissue, do not hold when applied clinically; and the author has concluded after hundreds of attempts that it is impossible to practically apply corneal grafting in human subjects.

The author discusses the development of auto- and heteroplastic grafts, both biologically and clinically. The results as found by histologic study are the same in all cases, i.e.: (1) massive necrosis of the conjunctive cellular elements of the graft; (2) an active fibroblastic proliferation; this fusiform cell proceeds from the host and penetrates the graft; (3) the epithelial coat of the graft alone definitely preserves its vitality and its cellular characteristics. These facts were observed in the animal experiments. The histologic examinations have shown a complete degeneration of the graft with the exception of the epithelial coat. The grafts are always substituted and regenerated by fibroblasts from the cornea of the host, and the graft thus loses its physiologic identity excepting the epithelial coat.

The facts demonstrated explain the conflicting results obtained in experimental and clinical keratoplasty. The experimental grafts are successful because they are regenerated from the surrounding transparent cornea, whereas clinical grafts fail because they are placed in degenerate cicatricial tissue.

The author calls attention to the biologic indications of these results and to the necessity of constant histologic examination as the only source of knowledge of the ultimate survival of a graft.

W. A. BRENNAN.

Higgens, C.: A Case of Spontaneous Cure of Cataract. *Lancet*, Lond., 1918, cxciv, 296.

The patient, aged 73, had had repeated attacks of iritis in both eyes. About forty years ago he developed cataract of both eyes, the right being worse; this was operated upon with good result. For years the vision in the left eye was such that he could only tell light from dark.

In the left eye, which he believed to have a cataract, there was a deep anterior chamber, tremulous iritis, a small central pupil but no sign of cataract. The lens was obviously dislocated and floated across the pupillary area on movements of the globe. There was no history of injury to the eye, but about ten years before, the patient had had a severe fall on the back of his head, and the author is inclined to believe that was the cause of the dislocation.

V. C. HUNT.

Chance, B.: A Case of Cavernous Angioma of the Orbit. *Ann. Ophth.*, 1917, xxvi, 547.

The patient was a girl of sixteen in whom the tumor was noticed soon after birth. It had gradually increased in size until it occupied the upper half of the left orbit and extended from one lateral rectus to the other, forward into the lid, and backward indefinitely. There was enlargement on elevation of blood-pressure, as in stooping, and when the upper lid was raised the purplish mass protruded like an enormous staphyloma of the sclera. The mass was accommodated by an absence of the orbital ridge in the middle third and by deficiencies in the external orbital wall and the roof of the orbit. The cornea was unaffected, the fundus healthy, and the skin of the body was entirely free from angiomata.

Dissection showed the tumor to be encapsulated with fibrous bands penetrating the capsule from the growth. It rested on the upper and outer aspects of the globe and was quite adherent to the sclera. Removal was accompanied by great loss of blood.

Histologic examination showed the tumor to have the character of erectile tissue, the spaces being lined with endothelium and having fibrous walls, many fields showing striated and unstriated muscle fibers.

A study of the sections gave no clue as to the probable origin of the angioma. The operative results, while not entirely satisfactory, left a vision of 6:30.

S. S. HOWE.

EAR

Brownfield, R. R.: Detection of Pretended Loss of Hearing, with Special Reference to Unilateral Deafness. *J. Am. M. Ass.*, 1918, lxx, 597.

In the author's device, batteries and make-and-break contacts are entirely dispensed with. The ordinary 110 volt alternating commercial lighting current is used. The variable current is produced by a potentiometer, and is variable from an absolute zero to maximum. No vibrating iron is used, and the maximum strength of the current employed is dependent on no factor except the ratio of the electrical resistances employed. The sound producer is similar to a telephone receiver except in one very important respect, i.e., the core is of soft iron and is not magnetized. This results in eliminating the variability due to demagnetization, and doubles the pitch, so that the ordinary 60 cycle current produces 240 vibrations per second, about equal to the average tone used in conversation.

The sound producer is provided with three lugs to hold it away from the ear so that the sound will be transmitted solely by air conduction. By simply turning the indicator from 100 to zero, one can cause the sound to increase from the point at which it is just perceptible to one of normal hearing, the threshold of audition, or 100 per cent acuity, to a degree of intensity at which failure to perceive it indicates that the subject has no practical hearing. In addition to the variable receiver, there is a supplementary one that always operates at maximum intensity, irrespective of the loudness of the other.

In the usual test for the acuity of hearing, only the variable receiver is used. As the subject holds this to the ear, the pointer is gradually moved from zero to the 100 point. As the intensity of the sound gradually decreases, he is told to indicate the point at which he is no longer able to perceive it. This point is noted, and the movement of the pointer continued still farther. The direction is then reversed and the subject directed to indicate

the point at which the sound is again heard. After one or two trials, the various readings will be found to harmonize quite closely unless one has a case of malingering, which may be readily detected by inconsistency of the readings. It is hardly necessary to remark that the electric control has a distinct advantage over the watch and whisper tests, as the malingerer is totally unable to guess what reply would be expected from one of defective hearing. The only precaution necessary is to place the instrument back of him. A small push button is provided which may be used to disconnect the receiver, in case the subject is uncertain whether he hears the vibrations or is confusing it with tinnitus.

The application of the instrument consists in having the patient hold the constantly loud receiver over the alleged deaf ear, and the variable receiver over the other. Starting with the pointer at 100 (minimum sound), it is gradually moved toward zero and the subject directed to state when he first hears the sound in his good ear. If he really suffers complete loss of hearing in one ear, as claimed, the presence of the loud receiver will not disturb him or interfere with the perception of sound by the other ear; in fact, it might just as well be disconnected. Under this presumption he would have no difficulty in clearly detecting the sound in the other ear, and one would soon have a proper index of its acuity. If, however, he is merely pretending and actually has a very fair degree of hearing in both ears, it would be absolutely impossible for him to identify any sound whatever in his good ear to which the variable receiver is applied until a point on the scale is reached that would normally indicate very defective or almost no hearing for the good ear.

The very nature of the test facilitates the detection of fraud, because the better he can hear in the alleged defective ear, the less will he hear in the other, a condition just the opposite of what he might expect; and so when he makes his usual negative reply, he is for once telling the truth and trapping himself.

OTTO M. ROTT.

Rott, O. M.: The Clinical Interpretation of Labyrinthine Phenomena in the Presence of Suppurative Inflammation of the Middle Ear. *Northwest Med.*, 1918, xvii, 56.

In the presence of spontaneous labyrinthine phenomena, the decision concerning the advisability of a mastoid operation rests largely on the question as to whether the type is a paralabyrinthitis or an acute diffuse labyrinthitis, and if the latter, whether there are or are not symptoms of meningeal involvement. If, for instance, during the course of a suppurative inflammation of the middle ear, the patient should complain of vertigo, nausea and vomiting, and an examination of the eyes revealed the presence of a nystagmus toward the diseased ear, with deafness not absolute, the condition would be a paralabyrinthitis and the best treatment would be the prompt opening of the mastoid.

If, on the other hand, there was absolute deafness of the suppurating ear, with the nystagmus directed toward the well ear, the condition would be one of diffuse labyrinthitis and the best interests of the patient would be served if one refrained from opening the mastoid during the acute stage, unless there are unmistakable evidences of beginning meningeal involvement, as determined by a temperature of over a hundred degrees, headache, photophobia, exaggerated reflexes, a positive Kernig, and positive findings in the cerebrospinal fluid.

Before undertaking a mastoid operation in chronic suppurative otitis media, the labyrinth should be tested and if found non-functionating, it would be safer to follow the mastoid operation immediately by a labyrinthine exenteration rather than to perform the mastoid operation alone.

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